

**DIGITAL GLOBALISATION OF KNOWLEDGE
AND THE IMPACT ON HIGHER EDUCATION**

IN SOUTH ASIA AND EUROPE

MAY 2019

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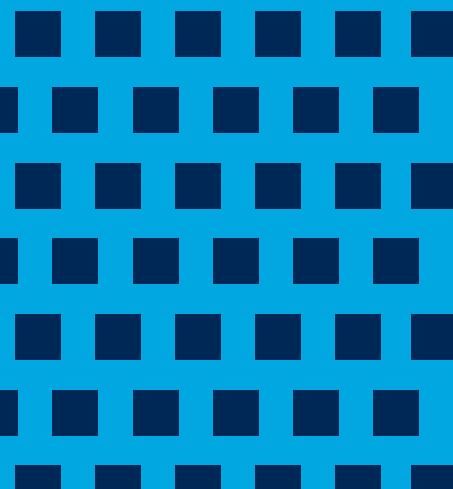
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The interpretations offered in this report are those of the authors and do not necessarily represent the views of the British Council, its officers, or those individuals who contributed to the research.

Foreword

The British Council Pakistan undertook this study in order to help build a better understanding of the state and influence of the digital globalisation of knowledge and its relation to Higher Education in South Asia, and Europe.

Both regions are at the beginning of a Fourth Industrial Revolution that is fundamentally changing the way people live, work and relate to one another. Both regions are impacted by globalisation and both will have a crucial role to play in shaping its future. Both regions believe that the digitalisation of knowledge can bring enormous benefits and unprecedented opportunities for everyone, as it helps build more prosperous, sustainable, secure, and equitable societies.

South Asia and Europe are affected by global mega-trends including the social media echo-chamber, learning to cope with information overload, the advent of AI, or simply the ever-increasing rate of change. There is also the ever-present issue of how to fund Higher Education when demand is growing, and government support is static or falling.

The impact of the globalisation of knowledge poses opportunities, challenges and critical ethical questions for Higher Education institutions and their role within societies and regions. There is a great deal of existing research on digital technology and Higher Education, but very little which makes a meaningful comparison between regions, each of which is at a very different stage in the adoption of digital technology. This lack of comparative analysis is limiting in that as a result there is little scope for sharing lessons and experience in ways that are mutually beneficial.

There was a desire to continue to explore and to find practical areas for collaboration, where Europe and South Asia can come together to help shape the future of higher education, and find some concrete, practical ideas for working together towards a common vision of quality education for all.

We hope that the findings of this study will inform future interventions that aim to enhance the positive influences of the digital globalisation of knowledge in Higher Education. While the study is about two regions, its lessons are wider, and we hope that its benefits will not be limited to these two regions alone. The report is being launched at the Going Global conference in Berlin in May 2019, an ideal platform to share and discuss with Higher Educational leaders ways to enhance the positive influences of the digital globalisation of knowledge, how to build on existing positive influences and encourage new positive flows of ideas and knowledge between Europe and South Asia.



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Executive Summary

The report compares the impact of digital technology on Higher Education in South Asia and Europe. Both regions are at the beginning of a Fourth Industrial Revolution that is fundamentally changing the way we live, work and relate to one another. Both regions also share the view that the digitalisation of knowledge can bring enormous benefits and unprecedented opportunities for everyone, as it contributes to more prosperous, sustainable, and equitable societies.

Higher Education has an absolutely crucial role to play, but our research shows that more needs to be done. It finds that there is a generally shared understanding at the level of academic leadership, and of those who are passionate advocates of digitalisation in Higher Education, of what needs to be done and how that needs to happen. It also finds that there is a strong drive from economic and social actors for the benefits of open and digital education to be available to all who want and need it. It also finds that for the evidenced benefits of digitalisation to be achieved, there needs to be an enabling and supportive policy and regulatory framework.

There are opportunities, but there are also challenges. The two regions are very different, and at very different stages in their journey towards digitalisation. By comparing their experience, it is possible to identify how they approach common challenges in different ways and to suggest some areas where they can collaborate to mutual benefit.

This report is unusual in making a direct comparison between two regions. As the Observatory on Borderless Higher Education notes, there is a “near absence of studies assessing the significance of online Higher Education on a global or cross-border level.” This report cannot claim to cover the whole of each region. Neither does it claim to provide rigorous quantitative analysis. Rather, it is context-specific, choosing to look at a limited range of countries, each of which has a different approach to meeting their specific challenges, against the background of global, rapid, technological and social change.

We asked leading educators, policy makers and academics what their views were on the impact of digitalisation in Higher Education on a range of topics:

The democratisation of education: What is understood by democratisation? How can Higher Education meet increasing demand?

Access to knowledge: We live in an increasingly global condition of information overload. What are the implications for Higher Education? What are the implications of digitalisation for research?

Access to education: How can populations in South Asia and Europe access the learning they need? What still needs to be done in policy, infrastructure development, pedagogical development, and quality assurance?

Pedagogical challenge: What does the evidence tell us about what works today? What pedagogical models are needed for the future?

Social purpose: How can digitalisation in Higher Education help tackle global challenges for the common good? What impact can it have on economic development and equalities? How can it meet the needs of diverse and often mobile populations?

Policies and institutions for the future: What is the future of digitalisation in Higher Education in South Asia and Europe? What policy initiatives are needed? What will the university of the future look like? How will the landscape of Higher Education look different?

There is no doubt that digital education will be transformative for societies in South Asia. As more and more people are connected to the internet and can access knowledge and learning, the effects will be profound. The Sustainable Development Goals (SDGs), monitored by UNESCO have given a real sense of urgency to develop digitalisation strategies that meet national ambitions for economic and social development and contribute to meeting SDG targets. Traditional education is not the answer. It can never be made available at the scale, quality or cost to make it genuinely inclusive. It cannot meet learners' individual needs, easily allow women and girls the same access to education and opportunity as men, or offer access to education to very large youthful populations. Governments have ambitious visions, active policies and programmes, but the challenge is implementation. There is also a challenge in how to ensure that global educational platforms meet the needs of local populations.

European societies are also changing, and the transformation will continue. The situation is very different to that in South Asia. Increasing numbers of universities and colleges offer, next to degree programmes, continuous education and lifelong learning, and open education mainly through Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs). New pedagogies have emerged and continue to develop. Universities are starting to develop visions and strategies to position themselves at the national and international level. Research has shown that universities need both supportive policy frameworks and the autonomy to act flexibly and rapidly to respond to changes in society and the economy. One clear difference between the regions is that in Europe the European Union offers regional level support for collaboration within an already strong innovation culture.

There is room for further development, however. Some think that South Asia has the potential to overtake Europe and that there is much that Europe can learn.

Meeting the demand for relevant, good quality, knowledge that is accessible to all, poses different challenges in each region, reflecting the varying contexts of each region and country. Our thanks are due to our contributors who generously shared their knowledge and insights with us as well as their commitment to education, knowledge sharing and social development through digital education. This report aims to start a dialogue between the regions, based on their common desire to realise the enormous potential of digitalisation in Higher Education.

Key Findings and Recommendations

The Fourth Industrial Revolution – the digital transformation of life as we know it – is based on a shift from digitalisation to innovation based on combinations of technologies, and it promises significant productivity increases in the late 2020s which can be available to countries that are ready for it;

These gains will elicit new challenges for Higher Education – an obvious issue is the need for lifelong skills development as the workforce transforms – this concern is already shaping digital policy and impacting on Higher Education. The need for higher skill levels also applies within Higher Education, for faculty and for students;

Access to digital Higher Education has to be equitable to ensure the maximum opportunity for participation in society and the economy of the future and thus achieve the promised gains of the Fourth Industrial Revolution. This will pose significant challenges which must be addressed as digital is the only way to provide quality learning at population-scale and meet the needs of individual learners;

There are anxieties that the impact on societies will be to widen educational, economic and digital divides. The challenge in closing these divides is huge, complex and multidimensional and Higher Education has a crucial role to play as a key contributor to the collaborative, multistakeholder approach needed to overcome the four key barriers to inclusion: infrastructure; affordability; skills, awareness and cultural acceptance; and relevant content;

In South Asia, these barriers are all still important, requiring both high-level political commitment and determination to translate that commitment into implementation;

In Europe, while there is no infrastructure barrier to speak of, very few questions of affordability, and significant though not universal pedagogical innovation, there are still serious challenges in relation to skills, and cultural resistance to change to traditional educational models;

Gender equality is a priority issue in both regions, but there are particularly serious challenges in South Asia;

Higher Education can also make a significant contribution through digital to progress towards the Sustainable Development Goals (SDGs);

Digital education needs to be values-driven if we are to realise the benefits. Traditional models of pedagogy and organisation will need to be radically reinvented – but without losing what makes Higher Education uniquely valuable today, helping people to think critically and openly about the world around them;

The pace of change will increasingly challenge today's models of access, pedagogy, collaboration, ethics and values, openness and institutional frameworks – data-driven innovation will happen. Higher Education will therefore have to learn how to develop and adapt its traditional values in a world of ongoing pedagogical and technological innovation;

New models of institutional collaboration will be needed to address global inequalities in knowledge and learning. There are opportunities through inter-regional cooperation to do this, provided such opportunities are of genuinely mutual benefit;

Digital will need to be mainstreamed in policy. It cannot any longer be treated as something separate – the days of the digital strategy are numbered. Policies and strategies for Higher Education need to start from the assumption that digital will be wholly integral to delivery from the start;

As society moves towards a future where everyone can access information via the Internet, for whatever purpose, Higher Education is uniquely placed to help people to access, interpret, and use data and knowledge in ways that are critical, creative, and positive;

There are differences and similarities between the impacts of digitalisation on Higher Education in South Asia and Europe. The greatest challenges and opportunities are for future collaboration for the common good. These two great regions can and must learn from each other. Specific areas where this report has identified opportunities for collaboration are:

Making progress towards the SDGs where, for example, experienced MOOC providers from Europe can help train future educators;

Creating gateways for research and knowledge exchange on topics of mutual interest;

Opening up pathways for inclusion, particularly for women and girls through specific online programmes and collaborations;

Working together to build capacity to develop and deliver locally generated content;

Joint pedagogical development activities;

Bringing multiple perspectives to bear on the values and ethics needed for the Fourth Industrial Revolution;

By establishing a focal point for inter-regional collaboration and exchange to make it happen.



Context

Introduction: The Digitalisation of Knowledge in Higher Education

The digitalisation of knowledge is having a major impact on Higher Education. This process is part of the wider context of rapid and disruptive change brought about by digital technology which has ushered in a new phase in the process of globalisation.

Global context

Digital flows have significantly increased over recent years, transmitting information, ideas, and innovation around the world and broadening participation in the global economy. In the last decade, global flows have raised world GDP by at least 10%; this value totalled \$7.8 trillion in 2014 alone and data flows accounted for a larger share of this impact than global trade in goods. The impact of digitalisation has not only changed economic globalisation, but also affected social and technological processes including security, social equality and education. It has the potential to drive innovation worth trillions of dollars more in industrial and public-sector applications.

The impact on Higher Education

The effect of digitalisation on Higher Education has been described as a turning point in the history of education. Worldwide demand for Higher Education is expected to grow exponentially over the next 10 years, and some forecasts predict that e-learning will grow by a factor of 15, accounting for 15% of all education provision. Therefore, the educational economy is one of the major sites of investment in digital technology.

This process is changing education itself. According to the Boston Consulting Group, the process of digitalisation has influenced the learning process in a variety of ways. They identify six dominant trends which are changing the competitive landscape of Higher Education:

- Democratisation of education,
- Lifelong learning,
- Individualisation of education,
- Experimental technological advancement,
- Digitised students, and
- Changes in workforce demand.

Many argue that for Higher Education institutions, success and competitiveness in the future will depend on their ability to embrace digital opportunities. The transition to digital education is a necessary innovation in the sector as current educational systems do not prepare our children adequately for the professions of tomorrow.

Opportunities

Although the ongoing process of digitalisation of Higher Education brings challenges, for instance in relation to data protection and privatisation, it is generally applauded for its benefits. While some have pointed to the positive effects it has on the preparation of learners, employers and Higher Education institutions alike, others have pointed to the fact that digital systems of learning increase exchange and interaction between scholars and students, and foster internationalisation.

Students see similar benefits. They argue that it enables them to focus on the content of studies, provides support for organisational problems, and grants easy access to resources such as literature and software. In addition, the benefits of digitalisation are expected to be reflected on a global scale, as it is expected that the economic benefits of increased digitalisation will become increasingly evident within developing countries.

Challenges

There remain major challenges in order to obtain the opportunities and benefits associated with the digitalisation of education:

- Universities can be slow or ineffective in adapting to the changing digital landscape. McKinsey's Global Institute Industry Digitalisation Index ranks the education sector 14th of 22 sectors;
- Government educational and digital policies need to keep up with the fast rate of change and ensure that their education systems as a whole are fit for purpose in the digital age and meet the expectations and needs of learners;
- There is some evidence that digitalisation can exacerbate inequalities through the digital divide.

Digital technologies may provide new opportunities for making progress, underscoring the importance of broadening access. But “tech fixes” can do little to address the underlying structural problems of inequalities. Gender gaps are a key element of the global digital divide, and they may even be getting worse. The evidence suggests that gender inequality in the digital sphere is essentially a result of beliefs about what is appropriate, and what capacities each gender has, more than about the technologies themselves.

Addressing the gender gap is an essential part of the UN '2030 Agenda for Sustainable Development which sets out 17 goals centred around equality. Long-term initiatives such as 'Education 2030' aim to achieve inclusive and equitable education and the promotion of life-long learning. The issues are complex, however, and it is worth quoting the OECD on this:

“Addressing the digital gender divide requires raising awareness and tackling gender stereotypes, while at the same time enabling enhanced, safer and more affordable access to digital tools and fostering strong co-operation across stakeholders to remove barriers to girls and women’s full participation in the digital world. ... Rather, the focus needs to be on putting in place concrete policy actions fostering women’s and girls’ full participation and inclusion in the digital economy, while at the same time addressing ingrained stereotypes and social norms that lead to discrimination and even violence against women.” (OECD, 2018)

The digitalisation of education is a global and fast developing process which offers many benefits as well as challenges for society and Higher Education systems. If the benefits are to be gained, and the challenges addressed, educational policy needs to take learning seriously, at all stages, from the primary through tertiary to lifelong learning. It needs to be willing to address basic issues of access, equity and assessment, and to focus on the learning outcomes that will benefit people and society. The digital has an enormous and increasing role to play.

The remainder of this section gives a high-level description and comparison of the situation in Europe and South Asia. It is clear that while digitalisation in Higher Education is being driven by globalisation, political, economic and social conditions vary between the 2 regions, and between countries in each region.

In Europe, the position is profoundly affected by the existence and actions of the European Union (EU) which allows for the creation of formal mechanisms (policy, financial, regulatory) and encourages flows of knowledge, innovation, students and faculty between countries. Also, the EU is a wealthy region of the world which is a global centre for digital innovation and exports.

Despite this relatively high level of regional integration, the situation in individual Member States varies, reflecting their different traditions and approaches to education and learning, and their different cultures.

In South Asia, there is no such regional body, and the situation varies perhaps even more between countries than in Europe, reflecting the impact of a wide range of economic, social and cultural factors. While Europe is often cited as a model of regional integration, South Asia is both one of the world's most dynamic regions - the world's fastest growing region - and one of the world's least integrated.

This report does not attempt to cover all of these enormous regions. Rather, it focuses on three countries in Europe and four in South Asia:

- Europe: the EU itself, Germany, Finland, the UK;
- South Asia: Afghanistan, Nepal, Pakistan, Sri Lanka.

By situating these countries in the global context, and drawing comparisons where possible, this report identifies a number of trends and questions for the future which are summarised in the Conclusions.

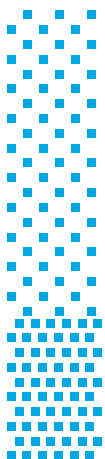
Europe

The European Union

The integration and innovative use of digital technologies in education is a policy priority for the European Union. There is a range of measures to support the digitalisation of education, which is also a key priority for several of the Europe 2020 Strategy flagship programmes, in particular the Agenda for New Skills and Jobs, Youth on the Move, the Digital Agenda and the Innovation Agenda.

There are strategies in place for digitalisation in school education and the Renewed EU Agenda for Higher Education emphasises that technology offers new ways of structuring learning and teaching. Work towards establishing a European Education Area is also driving integration of technology into education systems.

The European Commission devotes special attention to the promotion and advocacy of women in relation to digital transformation. There are four times more men than women in Europe with ICT-related qualifications. Moreover, there has been a decrease in women taking up ICT-related Higher Education compared to 201. In 2018, a new strategy 'Women in digital' was adopted to encourage more women to study and pursue careers in new technology fields and has a focus on advocating for more women entrepreneurs. To tackle the digital divide in Europe the 'Digital Skills and Jobs Coalition' brings together member states, companies' social partners, non-profit organisations and education providers to take action on skills.



Throughout the years, frameworks and guidelines have been adopted in order to make the EU a competitive digital economy and enhance digital skills. A range of institutional measures have been taken in education in relation to the still existing digital divide. The framework for European cooperation in education and training (ET 2020) has four main aims:

- Make lifelong learning and mobility a reality;
- Improve the quality and efficiency of education and training;
- Promote equity, social cohesion, and active citizenship;
- Enhance creativity and innovation, including entrepreneurship, at all levels of education and training.

Specifically, in relation to digital in Higher Education:

- The European Framework for the Digital Competence of Educators has published a guide for educators at all levels with a model that would allow them to assess and develop their digital competences in teaching;
- The Digital Education Action Plan includes a range of initiatives in the area of digitalisation of Higher Education. For instance, there is the European STELA project (Successful Transition from secondary to Higher Education by means of Learning Analytics). The ongoing refugee crisis has also spurred initiatives to involve refugees in the process of digital education (see particularly the Kiron Open Higher Education work with Refugees), and
- The Bologna Digital initiative aims to mainstream digital in Higher Education (see below). There are still challenges. In 2015, 20.6% of pupils did not achieve basic proficiency in science. Moreover, 75-80% of the students were taught by teachers who were not digitally confident. In addition, there were not enough resources for relevant technological equipment or for updating or upskilling teacher qualifications.

These and other challenges have led to additional measures (Ceemet, 6-7). At the beginning of 2018 an education package was adopted to complement the Commission Communication 'Towards a European Education Area by 2025'. It is a Council Recommendation which focuses on the need to develop basic skills and soft competencies in the context of life-long learning. In addition, it included a Digital Education Action Plan to support the overall development of digital skills and competences responding to the special need of women and youngsters.

In response to the Ministers' Conference 24-25 May 2018 in Paris, the Bologna Digital Group (academics and specialists on the digitalisation of Higher Education within the framework of the Bologna Process), concluded assessed that despite many efforts, the full potential of digitalisation has not been reached on a systemic level partially because it is still seen as an additional challenge rather than a means to meet existing challenges for Higher Education. Their recommendations are of interest and include the further opening up of the Higher Education system and the widening of participation, measures related to the recognition of non-formal digital learning; facilitating the admission process; student-centred approaches to learning, and work in relation to credentials as well as quality assurance.

Finland

According to the Digital Economy and Society Index (DESI), Finland is the third most advanced digital economy in the EU. In terms of human capital, Finland's digital skills were the country's strongest competitive advantage compared to other member states. In addition, the country is a top scorer in terms of digital public services. Fixed broadband is available to 97% of Finnish households, despite the geographical characteristics of the country. The Finnish Government actively takes measures to improve its digital position for instance, in July 2017, national legislation was revised to extend the national broad band plan 'the fast broadband project' until end 2019. There is still, however, a digital divide in Finland based on social factors such as class, status and age.

Finland's high position on the DESI is reflected in its approach to education which has a reputation of being one of the world's best education systems. Interestingly, in Finland, girls significantly out-perform boys in Science and Reading and are slightly ahead in Mathematics.

The Finnish Government has taken a firm stance in relation to digitalisation in the school system making the country a forerunner when it comes to the incorporation of e-learning and digital education. Digital literacy has been incorporated in the Finnish core school curriculum since 2016-2017. In 2016, the Education Ministry invested €50 million towards helping teachers to learn to use electronic devices in their work.

Particular attention is devoted to children's digital literacy. The government's Key Project aims to renew comprehensive education, learning environments and teacher's competence, and pays particular attention to digitalisation in order that by 2025 Finland is a leading country in knowledge, education and future learning. Although Finland is viewed as a global forerunner when it comes to e-learning, a study by researchers from the University of Helsinki has argued that the digital and phenomenon-based curriculum (using modern technology to prepare children for life-long learning and holistic thinking) hinders student learning.

Higher Education is a priority for the government in its efforts to adapt society to digital transformation. In negotiations concerning the public finances plan for the period 2017-2020, the Government decided to allocate a total of €105 million to the development of teaching in Higher Education. Digital education has become a full course at universities, for instance at the University of Tampere where students can apply to study Digital Literacy Education, where they learn competence in reading and writing for media and creating suitable learning environments.

Innovation is also reflected in the collaboration between universities and the private sector. In May 2018, the University of Helsinki and the technology company Reaktori launched a course on artificial intelligence, The Element of AI, which attracted 25,000 students on its first day. A similar example of collaboration was an open course Journalism as a profession, organised with the media company MTV.

Germany

Germany is Europe's largest economy and its ICT market is the fifth biggest in the world. However, despite Germany's reputation as an industry 4.0 nation, the country faces surprisingly serious challenges in relation to its digital economy. According to a study by the Organisation for Economic Cooperation and Development (OECD), Germany is ranked 29 out of 34 industrialised economies for fast internet connections. According to Reuters: "Europe's most powerful economy, at the forefront of industrial innovation for decades, is struggling to adapt to the digital age, and its policymakers are worried."

There are barriers in addition to the relative lack of high-speed internet. Others point to Government inefficiency and a reluctance to embrace new ways of working among small and mid-size firms, Germany's "Mittelstand". Added to that, years of surveillance by the Nazis and then the Communists have left many Germans suspicious of data sharing.

In addition, although Germans have good digital skills, the shortage of ICT professionals may hamper the future German economy. According to DESI, the country's greatest digital challenge is the improvement of the online interaction between public authorities and citizens, as only 39% of the Germans are e-government users.

Recognising these problems, digital transformation is now a priority for the Government. In 2014, Germany adopted its 'Digital Agenda 2014-2017' and in 2016 it launched its 'Digital Strategy 2025'. Since March 2018, a State Minister for Digital Affairs has been attached to the Chancellor's Office.

Concrete measures have been taken in relation to digital education. In 2016, the Federal Government presented its 'Digital Pact', a major investment of €5 billion into technology for primary school, as part of the 'educational offensive for a digital knowledge society' strategy between the Federal Ministry for Education and Science and the Federal States, which aims to create an efficient digital infrastructure for schools over next five years. The concern over Germany's digital education was confirmed by the influential Bertelmann Foundation (2017) which proposed that Germany must invest €3 billion a year in digital technology for schools if it wants to stay competitive globally.

The digital challenge applies equally to Higher Education. A survey of 200 universities conducted between March and April 2016 demonstrated that:

- 73% of German universities were pursuing a policy of enriching their teaching with digital components;
- 36% were delivering blended learning (a combination of face-to-face lectures with e-learning);
- 42% saw digital teaching as a tool for improving their programmes with the aim of increasing student success, the quality of teaching or the ability to balance family, life and study;
- Only 2% of universities had absolutely no digital components in their teaching and only 15% did not see digital teaching as a strategic goal, and
- Inter-university associations and consortia are widespread in the field of digital teaching with 70% of state universities collaborating with at least one other university.

This does not mean however, that the German education system does not face challenges. According to a report from the Monitor Digitale Bildung (2017), students have not turned out to be a driving force for digitalisation, and the full potential is nowhere near exhausted. The report observed that open educational resources, despite their availability, were not widely used, and pointed to concerns raised about uncertainty over quality, copyright and time management. Finally, the report noted that MOOCs (Massive Open Online Courses) were hardly used in teaching but were popular in academic training courses.

While it is clear that the digital transformation presents a significant challenge for Germany, it should be noted that is also a unique opportunity. According to a McKinsey Global Institute paper 'Driving German competitiveness in the digital future' (2017), it is estimated that by quickly adopting automation technology, the country could add up to 2.4 % of annual per capita GDP growth to 2030.

United Kingdom

The UK is a leading global digital economy and major tech hub, with its digital tech sector valued over £184 billion Pounds (a new tech job is created every 50 minutes). Within the EU, the UK ranks 7th compared to other member states in relation to the progress in digitalisation. In comparison to 2017, the UK has improved in all domains indexed by the report and scores particularly well in broadband coverage and take up, the use of online services and digital skills. However, a third of the population does not have basic digital skills and there is a need for more computer science graduates. Young people in the UK are technologically gifted – 97% of 15-24-year-olds have basic digital skills and 0% have none.

In March 2017, the government published the UK's 'Digital Strategy' to support the Digitalisation of the country, an umbrella strategy designed to complete the rollout of 4G and superfast broadband, as well as other issues. Currently a review is underway to investigate the UK's competition regime in the context of the digital economy. It will look at how this affects consumers, and the impact of competition policy on the UK's growth, productivity, wages and labour markets.

The UK's digital divide is narrowing in terms of broadband and mobile coverage, but 1.1m UK homes and businesses cannot access decent broadband. Also, some groups such as people who are registered disabled and the over-sixties are much more likely to be offline. There is a clear economic benefit to having digital skills – there is £13,000 pounds annual income difference separating those with basic digital skills and those without. Similarly, there was a digital gender gap as women and girls tended to have lower levels of literacy, education and digital skills.

The digitalisation of education in the UK is developing fast but remains a challenge. A report by the Higher Education Commission identified the potential to transform the Higher Education sector but cautioned that UK institutions were currently not making the most of the opportunities in this area.



JISC, the UK's "higher, further education and skills sectors' not-for-profit organisation for digital services and solutions" conducted a survey in 2017, the 'Student Digital Experience Tracker' which measured students' expectations and experiences of technology. The Tracker surveyed 22,500 learners. The main results were very interesting:

- 80% of students regularly use digital technology;
- Students rely on each other for technology support;
- 82% have access to reliable wifi;
- Only 50% of students thought digital skills would help them in employment;
- Most students thought digital tools made them more independent in their learning, but students were not convinced that digital tools made them feel more connected either with other learners or with the institution.
- Only 65% feel they have access to digital training and support when they need it (JISC). According to a report produced by Deloitte, financial challenges may overshadow the aspiration to make investments in the digitalisation of Higher Education over long term (Deloitte).

The UK's leading position as a digital economy will be affected by the outcome of the Brexit process, as it has potentially a serious impact on the digital economy and on education, both sectors which depend on a workforce drawn from other EU countries.

South Asia

This section of the report looks at four countries in South Asia: Afghanistan, Nepal, Pakistan and Sri Lanka.

Afghanistan

Despite improvements in life expectancy, incomes, and literacy since 2001, Afghanistan is extremely poor, landlocked, and highly dependent on foreign aid. Much of the population continues to suffer from shortages of housing, clean water, electricity, medical care, and jobs. Corruption, insecurity, weak governance, lack of infrastructure, and the Afghan Government's difficulty in extending the rule of law to all parts of the country pose challenges to future economic growth. Afghanistan's living standards are among the lowest in the world.

Even with development assistance, the Government of Afghanistan faces a number of challenges, including low revenue collection, anaemic job creation, high levels of corruption, weak government capacity, and poor public infrastructure.

In 2017 Afghanistan's growth rate was only marginally above that of the 2014-2016 average. The government has implemented reforms to the budget process and in some other areas. However, many other reforms will take time to implement and Afghanistan will remain dependent on international donor support over the next several years.

It is predominantly rural, with 75% of the population living outside the cities and the population is very youthful – 41% are 14 years of age or younger. Literacy levels are very low. Only 38% of the population can read or write and literacy rates are twice as high for men as for women. Levels of Internet use are low, at around 11%, as is the rate of broadband subscriptions (fewer than 1% of the population).

Government spending on education (including tertiary) stands at around 4% of GDP and almost 16% of public expenditure and is falling. However, enrolment in tertiary education is growing, from a low base, but in 2018 only some 14% of men and 5% of women participated in tertiary education.

Universities in Afghanistan have expanded over the last decade. **In the last decade, 36 public universities have been set up or re-established in Afghanistan.** However, while the physical infrastructure is improving, many lecturers have continued to follow traditional teaching methods. As a result, rote teaching has tended to take precedence over critical and analytical thinking, limiting student progress.

There are initiatives that aim to address this. To improve student learning, a programme is helping instructors modernise teaching methods through a “train the trainer” programme that promotes student participation, group activities, and critical thinking skills. The programme is supported by the Higher Education Development Program (HEDP), which is designed to increase access to higher education and improve its quality and relevance. It is funded by the Afghanistan Reconstruction Trust Fund (ARTF).

The HEDP also has as one of its main activities, increasing the use of ICT and internet-based resources in universities. It is equipping 12 universities with new functional ICT centres for ICT-Based higher education by 2020 and is developing a manual for the basics of ICT to be taught at the ICT centres.

The HEDP also aims to expand enrolment in degree programmes that are of direct relevance for future economic development, with special attention to increasing female enrolment in priority degree programs, through initiatives such as scholarships for female students from disadvantaged backgrounds to enrol in priority degree programmes and by developing on-line higher education courses to expand opportunities, especially for women who are physically constrained for cultural reasons from attending universities. The expected increase in student numbers will require expansion of a variety of physical facilities and equipment, such as lecture halls, tutorial rooms, ICT facilities and equipment, libraries and e-resources, residential facilities and water and sanitation.

Nepal

Nepal is the 16th poorest country in the world and the second poorest in Asia (after Afghanistan) in terms of per capita income. 23% of the population of 28 million people live on less than \$1.25 a day. The poorest people live in the inaccessible west of the country or are from the dalit (untouchable) caste. High unemployment means that about 1,500 Nepalis migrate for work every day to countries such as the Gulf states, Malaysia and India. Nepal is ranked 145th in the world in the Human Development Index, a situation which has not improved significantly since emerging from conflict in 2006.

While Nepal has one of the fastest rates of growth in national GDP in Asia currently standing at 7.5%, it still faces very significant challenges. As Nepal has relatively high poverty rates, it also has a high level of dependency on development support.

Development agencies have identified education as one of the pathways out of poverty in Nepal across all locations and social and economic classes, and investment in education is considered an important avenue necessary for increasing human capability as it helps enable individuals to compete for alternative and better paying opportunities through information and access to the job market.

Progress is being made, and people broadly have a positive view of education. Since the end of the Maoist insurgency in 2006, there have been tangible improvements in government education with an absence of gender, ethnicity or caste discrimination in use of school facilities, nor, with one exception, in school attendance. However:

Quality education seems to rely heavily on individual leadership rather than local monitoring or national inspections, and

Few people understand the purpose of school management committees or the role of local and national government in education provision.

In terms of gender, initiatives such as the United States Agency for International Development (USAID) Girls’ and Women’s Initiative have encouraged advancements in women’s and girls’ education and increased the life chances for girls and women.

It is true to say, however, that despite the claimed focus on education, the development research on Nepal, is more almost exclusively about conflict, security, health, environment, urbanisation and managing natural disasters, and no sign at all of research on the impact of digitalisation in education. This is a significant gap in knowledge and could indicate a missed opportunity in development programmes.

Other sources, however, exist, although the figures can seem inconsistent. For example, official data from the Nepal Telecommunications Authority estimates that 55% of the overall population has Internet access, but the ITU estimates that only 21% of the population are Internet users. In a country where the adult literacy rate is markedly low (64% in 2016) with numbers showing a distinct advantage of men over women (literacy rates of 75.3% against 54.2%), measuring the national digital literacy rate has been described by UNESCO as resembling a luxury.

There are signs that efforts are being undertaken in secondary education to boost the digital literacy of children and adolescents with students being positively inclined towards adopting e-learning methods.

However, it is Higher Education that is taking the lead. Despite having a relatively large population, the country only has six accredited universities, but it is building another three Higher Education Institutions (HEIs) to meet local needs. Tribhuvan University (TU), the largest HEI in the country, currently meets 80% of the overall demand. Higher Education Institutions in Nepal have also introduced a range of e-learning methods to improve the learning experience and to offer courses across the country targeting hard-to-reach populations.

In addition, there are civic society initiatives with a focus on data for development such as Open Knowledge Nepal, who are committed to open knowledge to empower citizens and enable fair and sustainable societies. Their projects include campaigning for Open Access to be a new norm in scholarship. They are often funded by development aid, mostly from the UK Government, the US-based Asia Foundation, or NGOs, but their agendas are ambitious and highlight an appetite for using data and ICT to share knowledge in the specific local context of Nepal.

Apart from computer-based learning, other digital learning practices include the use of mobile technology to support learners. This method is cost-effective as mobile phones are generally less expensive than laptops but also versatile as they can be used to facilitate access to learning content by rural populations in remote locations. However, in the Nepalese context the use of mobile phones in the classroom has been discouraged by teaching staff as it is generally considered a disruptive technology.

Unaware of both the benefits this new technology can bring, mobile learning has been treated with suspicion by government officials and parents. Nevertheless, Nepal offers fertile ground to re-think the use of mobile devices in the educational context as the rate of mobile cellular subscriptions is 111 per 100 people, with over 32 million cellular phone subscriptions. This compares to very low figures for personal computer ownership and fixed broadband internet subscriber rates.

However, serious challenges lie ahead. As the country has more than 120 different linguistic and cultural groups, it is hard to create a portfolio of services and products to respond to such diverse communities. Also, there are reports of a general feeling of disappointment among teaching staff who see political leaderships tending to import tested pedagogical frameworks from the West and often side-lining the work that is being done on the ground by Nepali tutors. These Western models, which make assumptions about the background knowledge and social status of students, tend to overestimate the capabilities of local institutions and at the same time underestimate the contribution of indigenous staff.

Pakistan

Pakistan has a rising GDP growth rate which has increased from 1.6% in 2010 to 5.8% today. Nearly 45% of the country's overall workforce is employed in the agricultural sector and a large portion of the population is rural or semi-rural. Access to electricity reached 99% in 2016, however the electricity network is not reliable as power cuts are a regular concern with citizens and businesses alike often turning to alternative forms of power to meet their needs.

In terms of demographics, Pakistan currently has the largest generation of young people ever in its history, with about two-thirds of the total population under 30 years of age. According to the United Nations: "As a section of the populace that is transiting to adulthood, this 'youth bulge' will prove to be either a dividend or a disaster for the country, depending on if Pakistan invests in youth by providing them with quality education, quality employment, and meaningful engagement opportunities."

The UN urges them to recognise that "The first lever is education for knowledge empowerment of the young. It is the most important tool for improving human development outcomes as education enhances the capabilities, freedoms and choices amongst the young." The UN also notes that: "The impact of globalisation with its accompanying information revolution has highlighted the need to rethink and re-design policies, considering the opportunities globalisation presents for progress – as well as its potential perils."

The Pakistani Government recognises this issue and youth is at the heart of its Vision 2025 policy document. Vision 2025 has seven pillars. Most relevant to this report are:

Pillar 1: the development of human capital, with quantitative targets for school and Higher Education, including a focus on gender parity and a dramatic increase in PhDs, and

Pillar 6: developing a competitive knowledge economy.

However, there are major issues in Pakistan's education system, including in Higher Education. While Pakistan has witnessed tremendous growth in the Higher Education sector over the past two decades, this rapid growth has failed to translate into satisfactory human development due to the pervasively poor quality of education and has resulted in an over-supply of graduates.

In addition to poor quality, and the stress on gender equality in Vision 2025, Pakistan is the second-worst performing country worldwide in terms of gender equality. The country is ranked 136 (out of a total 142 countries) in providing equal access to educational opportunities and 143 in terms of female economic participation (World Economic Forum, 2017). Gender disparity stands as a huge barrier in the country's path towards development as a large part of the population remains marginalised.

Around 33% of the population are broadband subscribers, around 20% of the country's adult population are Internet users, and most of Pakistan's population is expected to have access to the internet within a decade. The transformation is already underway – some 76 percent of Pakistan's population already has mobile phone access. These trends suggest that audio-visual and text material provided through cell phones will soon directly reach three-fourths of the population. However, it is worthwhile noting that Pakistan is ranked lowest worldwide in gender access parity with a 266% gap in internet access rates and 121% gap in mobile ownership in favour of men.

Today in Pakistan, according to the World Bank (2018), only a privileged 10% of the population is enrolled in tertiary education institutions although it should be noted that the number has doubled since 2006. Given the increasing demand for Higher Education, especially by middle class youth who see in a university diploma a secure future, the need to create mass learning environments is great.

While this is a positive trend, there are associated risks in developing e-learning initiatives without quality assurance frameworks in place. Studies have shown that cybersecurity is a widespread concern among users. As the cost of owning a personal computer or laptop is high, students rely heavily on university labs to complete their assignments.

Another major hurdle towards the deepening of digitalisation in HE is the unavailability of content in local languages. Latest research suggests that the predominance of the English language in the digital environment affects in a negative way how the medium is perceived in populations with poor English language skills. Thus, students with an advanced education and foreign language knowledge are more likely to adopt new technologies reinforcing the digital and social divide.

Lack of awareness of available digital tools and services has also been identified as a prevalent theme in a series of studies mostly attributed to the absence of proper induction sessions. However, poor services may also be an indicator of institutional resistance against the universal adoption of digital technologies in the classroom. The introduction of an ICT-based model of pedagogy in all educational levels presupposes broader changes in the educational system and a shift from a teacher-centred approach to a learner-centred approach, a change the sector may be eager to make but at a slower pace.

Sri Lanka

Sri Lanka is emerging as a competitive player in Asia's booming digital economy. With 32% (2016) of the overall population using the Internet and 53% having an Internet connection, the average literacy rate stands at an impressive 91.9% (2017) for a developing country.

Although Sri Lanka has benefited from spill-over effects from Asia's rapid digitalisation of services in the past two decades, its GDP growth remains relatively low by Asian standards, standing at 3.1% in 2017.

Sri Lanka's "Education First, Sri Lanka" policy (2013), includes a goal to develop Sri Lanka as a knowledge economy, with education playing a key role. The policy is unspecific as to how this will be achieved, but it is worth noting that IT proficiency is a basic competence in the primary curriculum, and at secondary level there is an emphasis on ICT.

The Sri Lankan Government monitors digital literacy rates. The overall rate reported in the first half of 2017 for Sri Lanka was 28.3%, an increase of 0.8 percentage points from the same period in 2016. The literacy rate for both men and women was increasing, though the rate for men is some 5% higher than that for women, and the rate of increase for men was slightly higher.

The digital divide in Sri Lanka appears to correspond more with levels of educational attainment (ranging from 1.4% for those with no schooling, up to 71.2% for those with a tertiary level education), language literacy (27.2% for Tamil speakers, compared with 35% for Sinhala speakers and 71.1% for English speakers), or geography (41.1% for urban dwellers compared to 26.5% for rural areas) than with gender. However, according to a recent report by UNICEF Sri Lanka (2018), the digital divide is much wider for schoolchildren aged 11-18 when comparing Internet access and usage in relation to gender. Boys are much more likely to have Internet access than girls regardless of their financial status or locale (67.6% against 33.1% respectively).

Finally, the least privileged are struggling to cover the digital skills gap compared to their more affluent peers whose previous exposure to high-end tech products and advanced English language skills, provides them with a significant head start.

Sri Lanka has an enrolment rate of 19% in tertiary education, with women on 23% and men on 15%. University-level degree programmes in IT and Software Engineering has been on offer at state universities for over four decades. Sri Lankan state universities produced 2,173 engineering and computer science graduates and 528 postgraduates in computer science and engineering in the year 2015 while 10,806 undergraduates were enrolled to the engineering and computer science faculties in eight Sri Lankan universities.

Today most Higher Education Institutions in Sri Lanka have adopted a blended learning model which combines traditional face-to-face teaching with online interaction. However, research has suggested that students tend to underestimate the assigned workload when it is delivered through a virtual environment which leads to poor time management and a refusal to accept responsibility over the consequences. Moreover, there is a need to improve training of teaching staff as well as support staff such as librarians, so that they make full use of the tool's potential. Their role has a huge impact on the learning process affecting student engagement with e-learning methods.

Tertiary education in Sri Lanka has a major role to play in enhancing the quality of ICT teachers at local schools. The Information and Communication Technology Branch of Ministry of Education in partnership with the University of Vocational Technology has introduced three graduate programmes for teachers under the B. Tech in ICT degree certificate. The programmes on software technology, multimedia, and web technology, and network technology seek to provide teachers with the required skills to empower a future generation with the relevant ICT education.

Global technology companies have played a major role in digital education in Sri Lanka for some time. In 2009 the government of Sri Lanka launched the 'Nenasala' (wisdom outlets), programme as a way to boost digital literacy and encourage economic development throughout the country based on its National Development policy "Mahinda Chinthana". Implemented in partnership with the Gates Foundation and Microsoft, the programme established centres, located in rural areas to give residents increased access to high-quality equipment, training, and locally tailored information to help them improve their lives. According to the Gates Foundation, the programme has helped Sri Lanka increase its computer usage and IT literacy rate "from below 10% in 2004 to almost 40% today". The majority of the Nenasalas are located within religious institutions, which have served as community centres and places of learning for centuries. This strategy has helped the government earn the confidence and trust of Sri Lanka's rural residents, who have had little access to technology to date. Each e-Library Nenasala is free and open to people of all religions and income levels.

There are many indications that policy makers are aware of the opportunities of digitalisation for higher (and other) education. Dr. Taimur Rahman noted (2014) that "Pakistan needs new, creative and revolutionary policies to realise the positive potential of the Internet, especially in the field of education. It is also important to recognise that technology is not the enemy but a great opportunity. At the end of the day the internet makes it possible to reach millions of people. To engage people in a meaningful way and to participate in the process of knowledge sharing and creation depends not on the technology but on how it is utilised. Pakistan's education policy makers must think more deeply about this area to convert the potential into reality." (Rahman, 2014)

Comparing giants: EU and South Asia

In the EU (and leaving Brexit aside for now) the basic trends show that there is a common vision towards making Europe a powerhouse for ICT innovation. Large-scale investments are being made to increase the number of ICT graduates and more and more new courses related to ICT are being established. Policies place emphasis primarily on two priorities:

The need to invest further in research and development to deliver cutting edge services and products to the world and,

To transition services for the whole spectrum of public administration from the analogue to the digital world.

To these ends, training and capacity building in new media technologies are a major concern at all educational levels. More specifically, the use of digital tools to enable teaching and learning has become pervasive in Higher Education in all three case study countries, with Finland showing a distinct advantage, leading the way for other EU members. The use of ICT in European universities combines traditional face-to-face teaching with online interaction as research suggests that blended learning is the most effective teaching method. The possibilities of e-learning in delivering vocational and lifelong training have been explored in-depth in the European context, with public-private partnerships offering increased opportunities to learners from a variety of backgrounds and age groups.

The key challenges in the EU refer to the failure of ICT policies in Higher Education to address social inequalities. On the contrary, the much-celebrated digital revolution seems to have exacerbated already existing problems, deepening the divide:

Older generations and lower income groups feel excluded from this new way of life;

Professionals who use ICT applications and services in their practice feel that the changes are slowly leaving them behind;

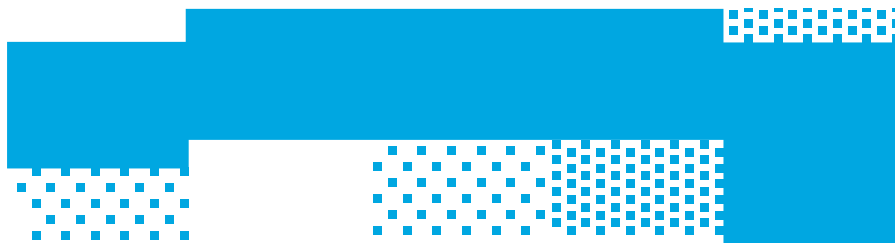
Older teaching staff feel greatly challenged by the digitalisation of the sector as more and more educational institutions adopt new technologies to deliver courses;

Despite the institutional support both staff and students are said to receive from their home institutions, both groups still feel to a large extent disempowered in front of the myriad possibilities these tools provide them with;

On a state level, further penetration of ICT in education will most likely slow down as austerity policies are still the preferred option for EU governments. National budgets have significantly shrunk since the onset of the Eurozone crisis, but this may be a golden opportunity for the private sector to lead in investments.

In South Asia, e-learning is gaining in popularity among teachers and students as the push towards digitalisation is encouraged by governments. However, the educational models of most South Asian countries still focus on learning through memorisation and therefore textbooks take a central position in student life. At the same time, the educational sector has demonstrated mixed levels of enthusiasm for the adoption of digital technologies in the classroom with technological changes happening at a much faster rate than the educational sector can manage.

Additionally, governments as well as students have not yet explored the potential of e-learning as a tool for lifelong learning, but still treat it as a teaching method that enhances the student experience, complementing traditional teaching practices taking place in the classroom.



E-learning has not become yet the prevalent mode of learning either in secondary or in tertiary education for a number of reasons:

Inequalities in access to digital technology for reasons of geography, cost and demographics;

There are greater differences between the South Asian countries studied, than between the European, and there is no regional structure similar to the EU that can develop and support a coherent approach to educational innovation across the region, address regional imbalances through resource-sharing, or share best practice and knowledge;

There is a lack of regionally-driven research and development, leading to a dependence on outside sources of support from technology companies or development agencies;

Policy responses across the region vary, reflecting the differences between countries. This is to be expected, but there are factors in each South Asian country that do not apply in other countries in the region, or in Europe (education in times of conflict; the need to tackle high levels of poverty; natural disasters; lack of a quality Higher Education sector with a strong research base...). These make direct comparisons hard;

The unavailability of content in the local language. Even when educational content is available in the local language, the user interface is by default set in English making it hard for users with no knowledge of the language to navigate the medium;

Cultural barriers still pose a serious obstacle in the adoption of new technologies in education. These vary from country to country, making it hard to generalise about the region. For example, women who use internet services may be treated with suspicion in the Pakistani context despite the fact that it may be a course requirement;

There is still a feeling that e-learning is not as 'respectable' as learning through traditional methods;

While people are enthusiastic about education, they are often suspicious of its quality and this feeling may impact on e-learning;

The cost of owning a computer or a laptop is still really high for the average citizen in all the countries under study in South Asia, therefore, universities need to consider offering labs and clusters that can accommodate a growing number of students;

There is also need for further investment in upgrading existing technological equipment at universities so that it can support software updates, and

It has still not been made clear whether the governments in South Asia distinguish between ICT policy for Education on the one hand, and Education for ICT policy on the other, as existing policy frameworks seem to confuse the two areas.

The dazzlingly changing policy landscape has not given much time to public and private actors to reflect on the impact previous policies have had and has not offered security to private actors to invest in the digital future of their countries.

Conclusion

Digital media are firmly entrenched in everyday life in the West. They are increasingly changing the way people live together, and they have far-reaching effects on the social, economic and political levels.

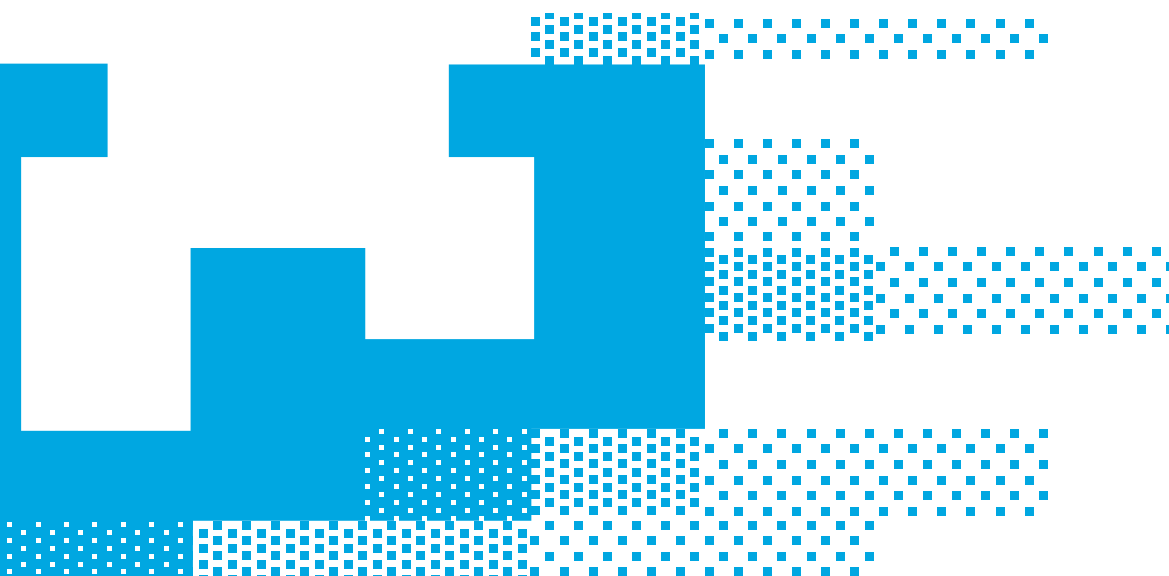
For universities, the changes and challenges brought about by technological change are fundamental and structural in nature. The term “digitalisation” in this report refers to more than the technical transfer of analogue information and behaviour patterns to a digital format. Rather, digitalisation represents a fundamental process of change that involves existing forms of disseminating knowledge and acquiring expertise, understanding of roles and organizational structures, and cooperation in and around universities, as well as the political framework.

This study draws attention to the potential of technological change and digitalisation for Higher Education, but also to the challenges and the pressure to act for policy-makers, university administrators, professors and other members of staff, through descriptions of the global social, educational and economic context.

For policy makers, there are many pressing challenges, whether of the need to maintain a leading position as a globally innovative country and society in an ageing continent, or the need to capitalise on the “demographic dividend” of a large population of young people who may miss out on the opportunities afforded by education and digitalisation of knowledge in contexts of rapid economic growth and social change.

For universities, it is apparent that digital education cannot be considered separate from existing fundamental challenges in the Higher Education system as a whole. In both South Asia and Europe, there is an increasing number of students and a more diverse student population. There is a common challenge of ensuring both that students are motivated to learn, and that they trust the quality of the education they receive. In both regions, there are questions relating to how universities relate to schools and to employment and lifelong learning. There are challenges of resources available versus the vision of educators.

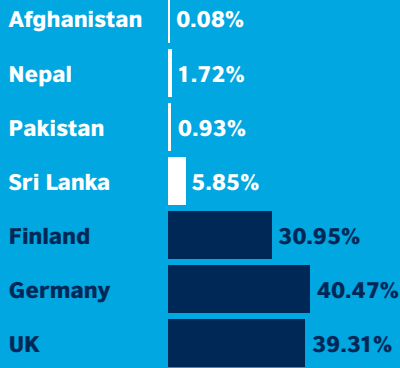
In this context digital education can aggravate naturally tense relationships. It creates its own set of challenges, particularly with respect to inequalities and access for all. At the same time digitalisation addresses many of the existing challenges and identifies potentially new solutions. Last but not least it offers new opportunities to further advance teaching and learning as well as the university as such.



The Impact of Digitalisation on Higher Education in South Asia and Europe

Fixed broadband subscribers per 100 people

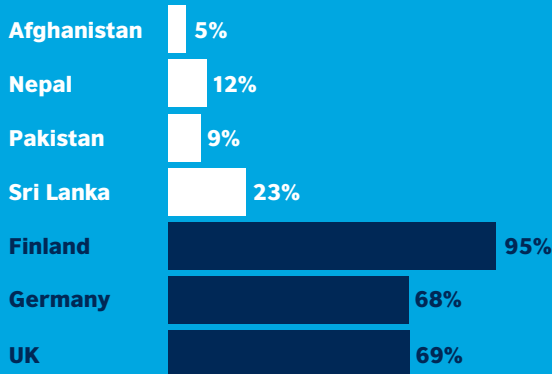
(2017) Source: World Bank



The available statistics on affordability of Internet access do not cover all of the countries in the study. Inability to afford a basic internet connection remains one of the most significant – and solvable – barriers to access. Around the world, over two billion people live in a country where just 1GB of mobile data is unaffordable. This issue is particularly acute in low- and middle-income countries, where 1GB of data costs over 5% of what people earn in a month – a price that is well over the affordable threshold of 1GB of data priced at 2% or less of average income.

Share of women enrolled in tertiary education

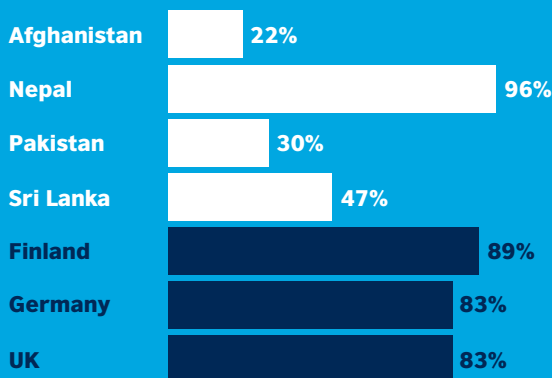
(2018) Source: UNESCO



Since the 1990s, more women than men complete tertiary education in most countries. According to the most recent data available, there were more female than male graduates from higher education in four out of five countries (80%) with available data. Despite improved access, women are less likely to continue into higher education levels and research fields.

Ratio of female to male labour force participation rate

(2018) Source: World Bank



Women are more likely than men to graduate from four broad fields of tertiary education: Education; Humanity and Arts; Social Sciences, Business and Law; and Health and Welfare. For instance, in Education programmes, women account for more than two-thirds of graduates in 88 out of 113 countries with available data in 2016.

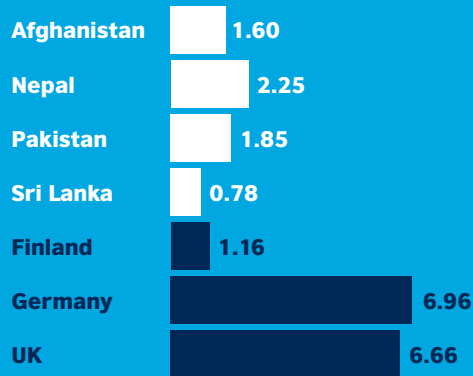
1. % of total population using internet/ broadband in Pakistan is currently over 32.6% whereas it was 21.32% in 2017

2. for Cost of Internet if it is average price of 1GB it is around USD 0.72 and there is hardly any change since last two years.

Per capita Income of Pakistan is currently USD 1640 which was USD 1630 in 2017. Data sources are Pakistan Telecom Authority www.pta.gov.pk (Annual Reports and Telecom Indicators) & Economic Survey of Pakistan www.finance.gov.pk (Economic Survey)

Cost per 1GB of data US\$

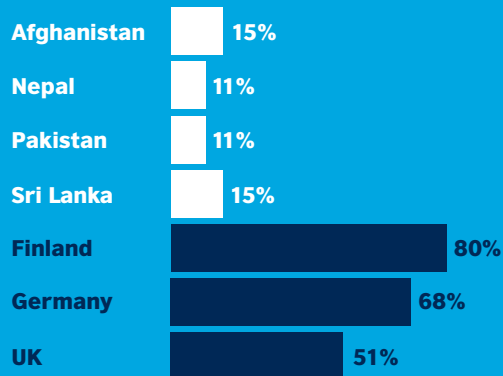
(2017) Source: UNESCO



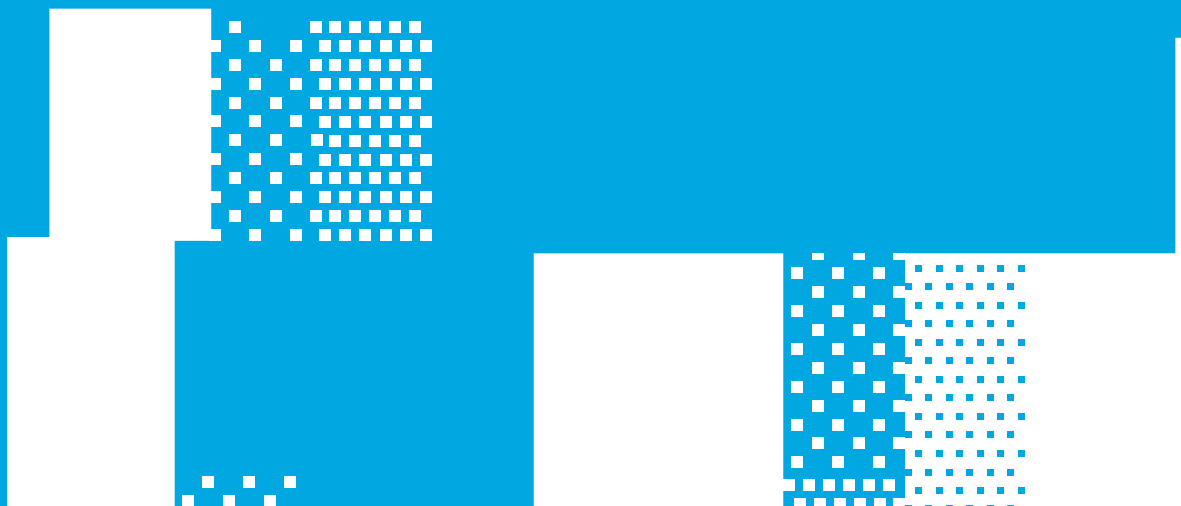
By comparison, men represent the majority of tertiary graduates in three broad fields: Information and Communication Technologies; Engineering, Manufacturing and Construction; and Agriculture. Among these programmes, a significant gender imbalance can be seen in Engineering, Manufacturing and Construction. Men account for more than three-fifths of tertiary graduates from this programme in 92 out of 103 countries with available data in 2016.

Share of men enrolled in tertiary education

(2018) Source: UNESCO



Only about 29% of the world's researchers are women. Central Asia, as well as Latin American and the Caribbean, have the highest share of female researchers at 45%. In contrast, the share falls to 19% in Southern Asia.



CHAPTER ONE:**THE DEMOCRATISATION
OF EDUCATION**

**What is understood by democratisation?
How can Higher Education meet
increasing demand?**

**“All countries in the world have similar
problems in relation to digitalisation.
Don’t start from tech – renew
pedagogy first”**



Introduction

By many measures, the knowledge economy is booming, but participation is confined to particular firms, places and people. It appears universal, but it is not, generating many of the problems of the world today. A key challenge for Higher Education therefore is how to help democratise the economy by widening access to productive opportunity. The sector also faces the challenge of reforming itself so that it can prepare the next generation for the labour market of the future by cultivating the mindsets, skills and cultures relevant to future needs. A democratised knowledge economy is partly about technical design. It is also about enabling people to become users and makers, not just consumers.

Our research confirmed that in every country, there was a sharp focus both on widening access to opportunity, and equipping learners with the skills they need to live meaningfully and productively in the digital world.

Partly driven by the needs of the knowledge economy, there is increased demand for Higher Education across the world, and across all demographic sectors of society. This poses challenges for universities. As the labour market demands more and more digital skills, as people live longer, as mobility increases and as populations shift, there is a growing diversity in the make-up of student populations. There is increasing pressure for Higher Education institutions to respond to the needs and problems of society at both the national and global levels. There is also pressure for Higher Education to commit to addressing global challenges, especially those relating to access to education. However, there is also an increasing shift towards reduced public financing. How can this circle be squared?

This section of the report considers the impact of digitalisation in Higher Education in terms of the realities of the globalised knowledge economy and its inequalities, where the universal aspiration for quality education is shaped and constrained by a mix of global forces and even wider mega trends which affect both educators and learners.

Globalisation

The practices, goods and services of Higher Education are highly adapted to a globally connected world. Even today, however, the vast bulk of Higher Education still takes place in institutions, for young people aged 18-24, on physical campuses, access to which is limited by previous levels of formal educational attainment, which in turn is linked to opportunity. In short, access to Higher Education is rationed by age, cost, and the availability of time to devote to learning. Universities are still seen as the gatekeepers to the labour market and economic prosperity.

Universities are also, traditionally, independent organisations dedicated to knowledge and to sharing that knowledge through learning and publication. A university education therefore equips people with both knowledge and skills, and crucially, a critical perspective on that knowledge and on those skills. In other words, universities have traditionally taught people about a limited range of subjects, and how to think for themselves.

The motivation of students can be surprisingly conservative. They want formally recognised, quality assured, qualifications that will help them access the globalised labour market. They also want to develop as individuals. The university years are a unique opportunity to do both. Universities, however, operate in a world where Government support is declining, and costs are increasing as demand from learners is rising. They also operate in a world where digital technology is transforming societies. Never before has it been possible for knowledge to be available to so many at so low a cost. Never before has the rate of knowledge production been greater. Never before has it been possible to publish and share knowledge so cheaply. Never before has the rate of change been so great. Never before has it been possible to collaborate in real-time across the world. Never before has the dream of education for all been a genuine possibility.

In both South Asia and In Europe, there are many innovative online projects which aim to ensure that Higher Education can be truly democratic in terms of opening up access to Higher Education for learners.

Mega trends

In addition to the political and economic context of globalisation, there are so-called mega-trends in knowledge and society that are shaping the world today, for better or for worse. In relation to digitalisation and education, the OECD has identified four that it sees as particularly relevant:

- **Learning versus the echo chamber:** Digital technology can connect people as never before, building links between countries and cultures. It encourages democracy by allowing voices to be heard, but it can also concentrate unprecedented amounts of power in a small number of hands and make the world more volatile and uncertain.
- **Artificial Intelligence** – first class humans or second-class robots? Education systems will need to equip young people with the skills and awareness to live in a world driven increasingly by algorithms. How can skills be adapted and updated for a changing world, with a changing jobs market? There are far-reaching questions many of which we cannot yet imagine.
- **Lessons for life:** Life expectancy is increasing, and a less predictable jobs market means adults are increasingly likely to need to re-train. Much more attention will have to be paid to lifelong learning, so that people are equipped to change jobs and for a much longer retirement. At present, those who need adult education and training the most, the low skilled, are currently the least likely to receive it.
- **Online or offline?** The internet is an integral part of young people's lives. In some countries the amount of time spent online by 15-year olds has effectively doubled in three years. Education still has to come to terms with this permanent online presence. What part should it play in learning? How can its negative impacts be reduced?

(Andreas Schleicher, OECD director of education and skills, January 2019)

Digitalised Higher Education is uniquely positioned to equip people to live in this new world. This response can take many forms and the case studies below illustrate this. What matters in relation to democratisation in the context of globalisation is that it works at both the global and local levels, bringing quality opportunities to people who otherwise would never be able to participate in the global knowledge economy.

They show how, in South Asia, a strategic governmental initiative, working with global partners and the Higher Education sector, is making leading content accessible, free of charge, adapted to local needs. In Europe a non-Governmental organisation is helping learners in incredibly difficult circumstances (refugees and asylum seekers) gain access to Higher Education.

South Asia

The drivers of the democratisation of knowledge in each country and region vary. Governments have a central role to play, but our survey research suggests that universities, technology companies and demand from learners are the main forces for change. In South Asia, our group discussion and interviews communicated a sense of urgency. There were acute social pressures, a desire to catch-up with other countries and regions, and an ambition to engage globally. Western models of digital pedagogy were essential, but there was a need to make them suitable for non-Western learners. The success story below describes an ambitious plan to tackle these issues head-on by connecting learners with world-class content, adapted to local needs, and available free of charge.

Success Story – Afghanistan

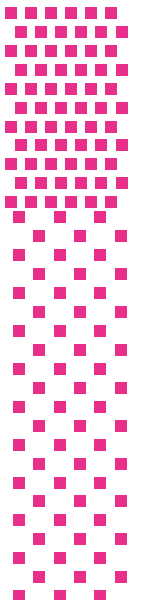
AfghanX: The Afghan Ministry of Higher

Education is creating an ambitious national open learning management system. They are working with nine regional universities who create and design their own MOOCs to go on the edX platform. The universities can adapt the MOOCs to their own circumstances. They will also be able to adapt global MOOCs and those on Open edX to offer MicroBachelors and MicroMasters courses with vocational or technical content. The MOOCs and classes will be used as a way to standardise the learning offer across the nine universities.

Through AfghanX, students can access free online courses in a variety of subjects. Students can do the courses without payment or they can choose to receive a verified certificate for a small fee.

Europe

In Europe, the urgency is more the need to compete successfully in the economy of the Fourth Industrial Revolution and adapt to social change. It is not the case that everyone in Europe has the same opportunities to participate in the knowledge economy, and migrants and asylum-seekers arriving in this case in Germany, face enormous difficulties, even if they already have qualifications which are not officially recognised. The project below is not the only such project, but it is an innovative and impressive example of what can be achieved.



Success Story – Germany Kiron: A bridge to Higher Education for refugees and asylum seekers through online learning.

Kiron is a non-profit organisation, based in Germany, that helps refugees and asylum seekers access Higher Education. Kiron provides a bridge to continue or begin studying at university-level. It is a learning opportunity, but it is not a university.

With Kiron, learners can get certificates from course providers for individual courses, but no degree. Courses are offered at Bachelor's level, but not at Master's or PhD.

Kiron is free, but only for refugees and asylum seekers.

Kiron can help learners transfer to an official university, if they live in Germany, Jordan, or Lebanon.

Kiron can guide learners, but they do not guarantee admission to a university – admission requirements are still high and set by the universities.

Challenges and opportunities

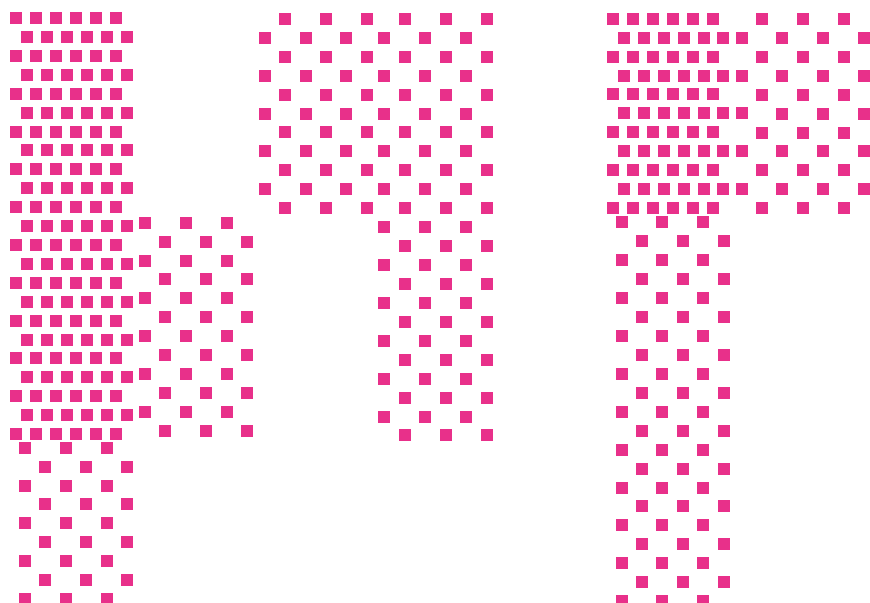
The challenges of democratisation are how to:

- Ensure equitable access to the Internet – as a first step;
- Widen access to productive opportunities by increasing digital skills and capacities;
- Reform Higher Education to ensure that it is truly inclusive, meets the needs of groups and individuals, and meets the need for continuous innovation that characterises the knowledge economy;
- Realise the potential of digitalisation in Higher Education in ways that are applicable in countries at different stages of development;
- How to avoid widening digital divides as the gap between leading centres of research and development grows.

The opportunities are:

- Universities can equip citizens not just to participate in the knowledge economy but to transform it through lifelong learning;
- To focus on using digitalisation to make the knowledge economy more inclusive by creating a wider skills and knowledge base;
- Higher Education can support initiatives to widen access and encourage a spirit of experimentation with digital technology;
- Universities can support learners to develop skills and access networks, as well as acquire knowledge;
- Governments can explicitly encourage the democratisation of innovation.

There was a general view, however, that if the sector in each region and country can work effectively with its partners in government, the innovation economy, civil society, and with learners, then it can fulfil the promise of digitalisation and, more importantly, bridge divides between digital haves and have-nots, between those who have access to education and those who have not, and help create the citizens of the world of tomorrow. These themes are explored in the following sections of the report.



CHAPTER TWO:**ACCESS TO
KNOWLEDGE**

We live in an increasingly global condition of information overload. What are the implications for Higher Education? What are the implications of digitalisation for research?

“People are still not aware that there’s so much knowledge available. Once you know you can build on each other’s ideas.”



Introduction

In the past there was linear growth in human knowledge. Today that growth is exponential. The quantity of knowledge available is increasing faster than ever. According to one estimate, by Lutz Bornmann, at the Max Planck Society, and Rüdiger Mutz, at the Swiss Federal Institute of Technology, the amount of global scientific knowledge doubles every 9 years or so.

This is an unprecedented rate of growth in human history, and the situation is complex. Impressive though the overall rate of scientific knowledge increase is, different types of knowledge within science have different rates of growth. For example, nanotechnology knowledge is doubling every 2 years and clinical knowledge every 18 months. Human knowledge is only part of it, however. Machine knowledge is increasing much faster. According to IBM, the build out of the “internet of things” will lead to the doubling of knowledge every 12 hours.

This is a major challenge for Higher Education, especially as access to knowledge is not universal. There are many reasons why sharing knowledge is beneficial but there are also many reasons why knowledge is not shared. There is a knowledge divide in the world today. While the digital divide refers to access to the Internet which gives access to information, access to data is useless without the knowledge to understand the content, make sense of it, and use it. This inability to turn digitalised information into economic and social value is part of a “knowledge divide” which is far more significant than questions of access which are urgent, but which are being remedied with investment.

The data revolution

Within Higher Education the key is Data Science, which is an interdisciplinary field that enables us to find meaning and appropriate information from large volumes of data and use those data to make important decisions in business, science, technology, and even politics.

Universities therefore have a crucial role to play in relation to this revolution in data and knowledge. Data Science as an academic field is clearly crucial, but just as important is the ability to “do data right”. The data revolution is already having major impacts which go far beyond the simple ability to access knowledge online into questions of what it will mean to be human, how to lead a meaningful life, how to act ethically in a world where knowledge is shared with, produced by and shared by, machines.

While the data-driven knowledge revolution is embraced by governmental interests, some business and some academic leaders, challenges remain.

The first question is whether “big data” is changing traditional research practices and even the nature of knowledge itself. Our society has an unprecedented ability to produce and store breathtaking amounts of data and, much more importantly, we have the tools to navigate the data in such a way as to identify patterns - correlations - within the data, rather than causations. In that way science can advance without models or theories. This is new and it goes to the heart of how research is done. Does the power of data render obsolete the use of the scientific method as we have known it since Galileo as some have claimed? If so, the implications for Higher Education are profound.

The second question generated by access to data is “why learn when you can look it up? This question too is radical as it asks the question: is understanding overrated? Could it be that smart algorithmic searching through oceans of data can spare us the hard work and pleasures of learning how the world works?

Both of these questions were raised repeatedly in the course of this project and a variety of views expressed, ranging from unrestrained enthusiasm to restrained scepticism. Nevertheless, some universities are embarking on highly strategic initiatives where data-driven digitalisation promises to offer transformative opportunities.

Success Story – UK

University of Edinburgh: Data-Driven Innovation and the Edinburgh Futures Institute

The Data-Driven Innovation initiative will use high-speed data analytics to capture flows of data and understand what they tell us. The aim is to bring better and faster capability to identify trends and behaviour across many sectors, leading to improved services for consumers and citizens.

The 10-year programme is run in collaboration with Heriot-Watt University and industrial partners to develop data-based projects in the public, private and third sectors.

The Programme will increase the contribution of university research and in-demand graduate skills to the region’s economy, launching more spinout companies, attracting start-ups and established businesses, and driving public and private sector investment.

Five data-driven innovation ‘hubs’ have been created, housing expertise and facilities to help 10 industrial sectors become more innovative through data. A new super-computing facility for the secure and trustworthy analysis of datasets, which will be unique within Europe, will support the work of the hubs.

The Edinburgh Futures Institute is one of the five hubs. Its vision aims to address the challenges of change which cross the traditional boundaries of national borders, institutional walls and areas of expertise. The Edinburgh Futures Institute is an interdisciplinary response which will be home to a range of world-leading research groups looking at cultural, technological, political, social and managerial challenges. In educational terms, it will offer opportunities for students who want to work across disciplinary boundaries to address real problems, think deeply about the social implications of technological change, and learn in new and creative ways.

Open research

More practically, academic research often exists behind paywalls. This restricts access by increasing costs. There are also the practices of publishing which depend on copyright. There are initiatives in both South Asia and Europe to tackle this which are highlighted below.

South Asia

Participants from South Asia were all committed to making knowledge available and communicated a strong desire to address all aspects of access to knowledge. There is a lot going on: major infrastructure investments, changes to legal frameworks to increase access to digital education, a focus on skills for work and employment, and a recognition of the need to address data security and trust in online learning. The need is urgent, progress is being made, even if it is not always as fast as some would like and is bringing new opportunities for economic and social development.

Success Story – Pakistan

HEC Connecting Universities
to Research World

Pakistan Education and Research Network (PERN) is part of the overall vision and objectives of IT Action Plan of Government of Pakistan.

The main objectives of PERN are to Provide state of the art Telecomm infrastructure and services to Educational and Research institutions, a dedicated Educational Network for Public/Private Universities & Higher learning Institutions registered with the HEC Government of Pakistan. Moreover, the interconnectivity between all 190 universities / institutes which will provide integration of data banks, collaboration for research and development activities and up-gradation of teaching and learning skills. The mission of PERN further aims to build and strengthen the research culture in Pakistan along with integrating Digital Library usage into the educational and research process.

The PERN core network using the Existing Optical Fiber System of PTCL/NTC and IP/ATM backbone of NTC. The network design of PERN consists of three nodal points (PoPs) at Islamabad, Lahore and Karachi. In addition to that, the interconnectivity between Nodal Points is 50 Mbps and the educational institutions are connected to their respective nodal point by minimum 2Mbps link from the nearest exchange of NTC/PTCL using OFS, DXX, DRS, Radio or VSAT. The 155 Mbps Internet Bandwidth is distributed at three nodal points.

PERN UPGRADATION:

The project is designed to increase the Bandwidth (core) up to E3 level and Increase the number of PoPs (Core Nodes) from 3 to 9 for PERN connected universities. PERN is an infrastructure to conduct the distance learning programs. HEC has funded Rs. 196 Million to purchase and setup the Video Conferencing equipment at 56 public sector universities and higher learning institutions. This service will be augmented with two MCUs, one at each northern and southern regions of the country.

Europe

In Europe, the benefits of online collaboration for research are universally recognised. Collaboration on research is seen as the natural thing to do, and the Internet is the method of choice by which to connect. Exchange of information on a global scale is more and more important for Higher Education and it is becoming easier and easier. It is hard to find a Higher Education institution that does not have internationalisation as part of their strategy.

Success Story – Europe

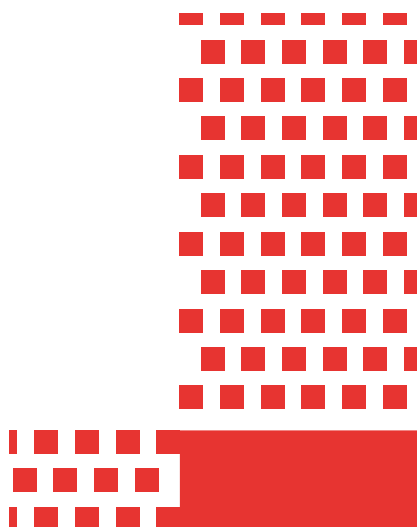
Plan S / cOAlition S: Science Europe OA

On 4 September 2018, 11 national (European) research funding organisations, with the support of the European Commission and the European Research Council (ERC), announced the launch of “cOAlition S, an initiative to make full and immediate Open Access to research publications a reality.” It is built around Plan S, which consists of one key and 10 subsidiary principles.

The key principle of Plan S states: “After 1 January 2020 scientific publications on the results from research funded by public grants provided by national and European research councils and funding bodies, must be published in compliant Open Access Journals or on compliant Open Access Platforms.”

Authors retain copyright of their publication with no restrictions. All publications must be published under an open license, preferably the Creative Commons Attribution Licence CC BY. In all cases, the license applied should fulfil the requirements defined by the Berlin Declaration in Open Access to Knowledge in the Sciences and Humanities (2003).

The Chief Executive of UKRI (UK Research and Innovation) Professor Sir Mark Walport, said at the launch: “Making research widely available and freely accessible is essential to unlocking its potential for creating economic, social and cultural benefits.”



Challenges and opportunities

Knowledge and the technology to digitalise it, access it, share it and interpret it are not universally available at the same time. Therefore, the way they spread across countries is central to how global growth is generated and shared.

The challenges to access to knowledge identified in our research are:

- How to ensure that the rush to digitalisation does not exacerbate knowledge divides?
- As society moves towards a future where everyone can access information via the Internet, for whatever purpose, how can digital Higher Education help people to access, interpret, and use data and knowledge in ways that are critical, creative, and positive?
- How can Higher Education help people cope with the sheer pace at which the amount of knowledge is increasing?
- How can we work together, and bring the best knowledge in the world to bear on tackling both global and local problems?
- What policies, strategies and practices are required when future-oriented Higher Education exists within a complex system of digital infrastructure, future work opportunities, data security, and the law?

The opportunities are to:

- Build on the common understanding revealed by our research in both South Asia and in Europe, that the era of isolated solutions must come to an end;
- Address the challenges of the immediate future by working across organisations, in networks, and in a concerted effort;
- Make every effort to make knowledge and data openly available as widely as possible.
- Build on initiatives such as the new European Copyright Directive which opens the door to the mass digitalisation of books, films, and audio recordings, much of which has research value. The Directive prevents publishers from placing “digital locks” that prevent researchers from conducting text and data mining. The change is seen as highly beneficial to European universities.

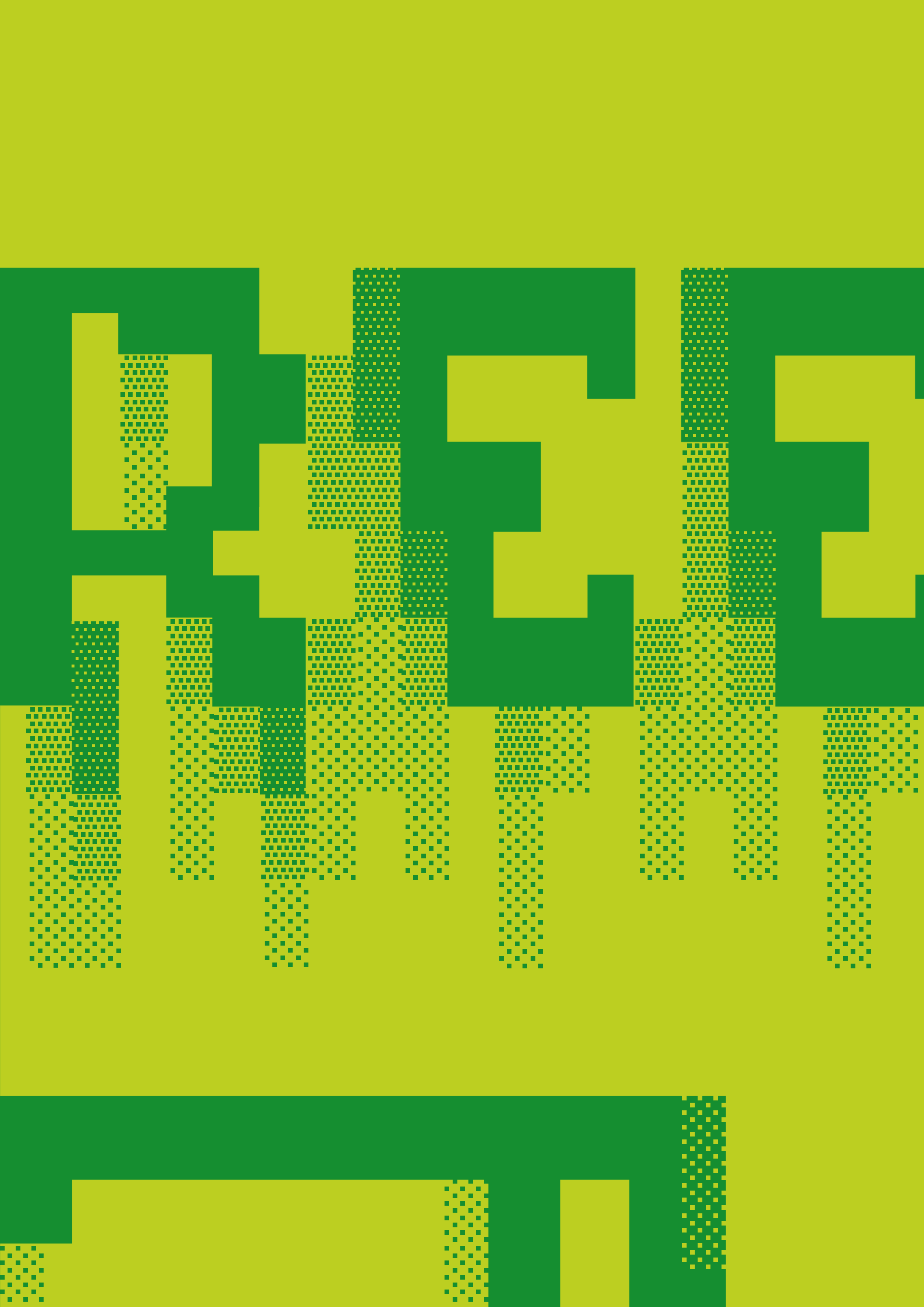
Overall, there was a strong feeling that Higher Education is the key site of knowledge exchange. Its role as both a cause and an effect of globalisation positions it as the key point where knowledge is produced, shared within research communities and with learners, and, increasingly, where trans-disciplinary debates about the society of the future are taking place. That has significant implications for learners, universities, businesses and governments.



CHAPTER THREE:**ACCESS TO
EDUCATION**

How can populations in South Asia and Europe access the learning they need? What still needs to be done in policy, infrastructure development, pedagogical development, and quality assurance?

“The sky is the limit but even when we inhale oxygen, we’ll be digitised. We have started depending so much on technology.”



Introduction

Access to education is about more than physical access to online learning through technology. This report does discuss that, but it reflects more on what access means for each region. While it is true that there is a general awareness of the opportunities, affordances, and challenges of digital technology and of the very practical questions that need to be addressed, the question that this study addressed was to understand how Higher Education is addressing the different questions of access, and what the impact of doing so was on Higher Education in two very different regions of the world.

Access to education: the global challenge

Achieving universal access to education (Sustainable Development Goal 4) is a global challenge. SDG4 is about more than access to Higher Education. As the United Nations notes, some 30% of children still receive no education at all, and while more children are accessing education, it is often of very low standard – more than 50% of children and adolescents worldwide are not meeting minimum proficiency standards in reading and mathematics.

The UN recognises that disparities in access to education along the lines of gender, urban-rural location and other dimensions still run deep and urges Member States to invest more in education infrastructure, particularly in the 47 Least Developed Countries (LDCs). Two of the countries included in this report, Afghanistan and Nepal, are among the countries the United Nations identifies as LDCs. A country is classified among the LDCs if it meets criteria related to poverty, human resource weakness (including in education), and economic vulnerability.

SDG 4 aims to: “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. This report is timely in that progress against the SDG4 targets will be reviewed at the high-level UN political forum on sustainable development in July 2019. Target 4.3 of SDG 4 is specifically relevant to this report, as it commits countries to “Ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university” by 2030.

South Asia Regional Symposium on ICT for Education – Sri Lanka 2018

The South Asia Regional Symposium on ICT for Education took place in Sri Lanka in February 2018. The Symposium was organised by UNESCO and the Asian Development Bank to discuss the role of ICT in education in addressing SDG4.

The symposium noted that South Asia faces the challenges of improving the quality of education in parallel with the continuing need to increase access.

The main findings of the Symposium were:

- While South Korea and Singapore were role models of countries that had achieved prosperity through investment in education, investment elsewhere in the region is rather focused on procurement of hardware. Other key ingredients, such as connectivity, people and contents, have not received adequate attention;
- A comprehensive ICT in education master plan was needed in each country with clear milestones towards achieving national education goals;
- Professional teacher development in ICT for education was needed;
- The private sector was increasingly active in developing digital educational contents through partnership with government in the region;
- Coding was an emerging area for educating “future-ready” children;
- ICT for education was identified as a priority area in the SAARC Framework for Action for Education 2030, and UNESCO was supporting and monitoring progress. Their monitoring focused on two key global indicators:
 - The proportion of youth and adults with ICT skills (SDG4.4.1), and
 - The proportion of schools with access to the Internet and computers for pedagogical use. The systematic use of ICT in education sector was important, and vocational and Higher Education were seen as priority areas in using ICT, and
- During the symposium’s final country action planning session, all the participating countries commonly identified two key priority areas:
 - ICT in education national policy development and
 - Improving teachers’ ICT skills and their use of ICT in teaching and learning.

The United Nations sees digital education as central to progress. The roadmap for SDG4, the Education 2030 Framework for Action (FFA), recognises that a well-established and well-regulated tertiary education system can take advantage of technology, open educational resources and distance education to improve access, equity, quality and relevance. UNESCO is therefore developing initiatives at regional and national levels and working with donors, Member States and stakeholders, to address quality enhancement, internationalisation and digital education. Digitalisation in Higher Education therefore has a crucial role to play in meeting SDG4 and our research highlighted initiatives which are addressing that.

South Asia

Rising demand in South Asia for access to Higher Education is currently not being met, despite its growing importance in economic development. As South Asian countries grow their economies, the role of the Higher Education sector in facilitating a skilled, knowledgeable workforce has become critical.

There is, however, a disconnect between the needs of the market and the courses offered by Higher Education institutions which has contributed to high levels of graduate unemployment and underemployment. A successful outcome-based Higher Education experience is becoming more of an imperative in South Asia, where unemployment is not an option.

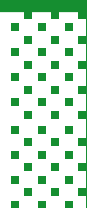
Female representation in leadership remains low by any benchmark, despite huge progress being made at undergraduate level with women almost reaching parity in numbers with men. Numbers in Afghanistan, for example, have grown from virtually zero during the Taliban era to nearly 180,000 women in tertiary education today. However, just 3 per cent of vice-chancellors in the region are women.

Our research confirmed that digital technology undoubtedly offers the possibility dramatically to increase access to Higher Education in South Asia. The first priority in the region is access to learning, making learning opportunities available to people who have never before had the opportunity to participate. Education offers the chance to help effect national transformation, holding out the prospect of economic growth, employment, and a way to address deep-rooted social inequalities.

The challenges and opportunities identified in this research are described below. There is no doubt that there are very significant initiatives underway. However, there may be a knowledge deficit in how to take advantage of these investments. As the World Bank notes: “while access to devices, connectivity and digital learning content is spreading quickly around the world, knowledge about how to harness increased levels of access to technology in ways relevant and practical for policymakers and educators in so-called ‘developing countries’ is not spreading anywhere near as quickly.”

They go on to note that: “The vast majority of research and documentation related to the use of educational technologies around the world is generated from within ‘highly developed’ countries (most of them in Europe, North America and East Asia), animated and informed by research questions and the needs of education communities and education systems in these same countries.”

They go on to report that the World Bank, inspired by an idea conceived by the UK Department for International Development, is setting up a Research and Innovation Hub on Technology for Education to address this.



Success Story – Pakistan

The **Universal Service Fund** was established by the Government of Pakistan (Ministry of Information Technology) to spread the benefits of the telecom revolution to all corners of Pakistan. Universal Service Fund promotes the development of telecommunication services in un-served and under-served areas throughout the length and breadth of the country.

The main objectives of Universal Service Fund (USF) are to:

- Bring the focus of telecom operators towards rural population and increase the level of telecom penetration significantly in the rural areas through effective and fair utilization of the fund.
- Improve the Broadband penetration in the country.
- Bring significant advances towards enhancement of e-services, both in rural as well as urban areas of the country.

Its projects include:

- Broadband for Sustainable Development Projects
 - Broadband for Un-served Urban Areas. The Broadband Program has been launched aiming at improving broadband penetration in unserved 2nd/3rd tier urban areas;
 - Optic fibre Connectivity to unserved tehsils (administrative districts)
 - ICTs for Girls – which aims to provide ICT facilities to increase the employability potential of the girls in Pakistan. The programme has:
 - Established computer labs in 144 “Women Empowerment Centers” in un-served and underserved areas of Pakistan. Through this program over 15,000 girls will be trained annually at state-of-the-art computer labs under the coaching and training program of Microsoft, and
 - Established Computer Labs in Government Girls Institutions of the Islamabad Capital Territory – 226 Schools have been provided with ICT Model Labs and 202 teachers have also been placed at these institutions. These teachers have been trained by Microsoft under Train the Trainer program on 21st Century Super Skills. This project will help in making over 110,000 girl students studying in Islamabad’s schools “Computer Literate” and bring them to the level of students elsewhere in the world.
-

Europe

In Europe, by contrast, where there are very few limitations on physical access or social barriers to online learning, there is a variety of views as to how to realise the full benefits of access once it has been achieved. There is also uneven use of digital technologies by institutions within countries and it is far from the case that online learning is universally used, even where it is available.

There is a view that in its initial phase, everybody involved raced to achieve access to digital education. That race was followed by fear that the investments were not delivering the dramatic improvements in learning outcomes that had been predicted. Today, Europe is in a third phase, which could be described as realism. Access continues to be developed further, particularly to ensure opportunities for lifelong learning, and the continuous upskilling opportunities that people need to thrive in the knowledge economy.

There is also concern in Europe that participation by women and girls in the knowledge economy may even be declining and that more needs to be done to involve them in Data Science, Computer Science and other subjects that are required by the labour market of tomorrow.

There is also a recognition that the digital generates new pedagogical, ethical and social issues in an educational culture that is in some ways resistant to change. Students go along with digital learning, but they do not see anything extraordinary in it. Rather they are so immersed in the digital world that they expect nothing else. The digitalisation of learning is not therefore seen as an end-point, but as a constantly evolving process, where the challenges are pedagogical or managerial rather than technical or infrastructural.

Some academic leaders see digitalisation today as offering improvement rather than profound systemic disruption. As its impact is better understood, they are better able to see where it works well and what its limits are. This does not reflect negatively on digital education, rather it is a reflection of the fact that access needs to be seen as the first step, and that the next challenges in Europe are to develop strategies for how digitalisation can be used to equip universities to survive and students to thrive in the highly competitive global knowledge economy.

Success Story - Finland

Dare to Learn: a community space for rethinking learning.

Dare to Learn started as an idea at the time of the centenary of Finland. A group of students in SYL (the national union for students in Finland) wondered what was the world still lacking? How could they make an impact? What was the coolest thing they could do in Finland in its celebration year 2017?

They discussed their idea of an international learning event with influential people in Finland and took it out to see if it was supported by the key actors in education. The idea was generally supported. So, they created an international meeting place where people could share, question and create the future of learning. Sivistyskiihdyttämö's mission is to promote lifelong learning, by organizing Dare to Learn.

Dare to Learn started from the idea that continuous learning was the key to sustainable success and well-being, especially at times of rapid social, environmental and economic changes. It also aimed to make learning joyful and available for all. The idea was to build a new learning culture through access to the newest knowledge and an ability to cross-communicate. Dare to Learn created a space for people to rethink learning by bringing professionals and practitioners in lifelong learning, government, institutions, education companies, and NGOs together.

While Dare to Learn was started by student volunteers, today it is supported by 8 universities, Education Finland and Akava (the Confederation of Unions for Professional and Managerial Staff in Finland – a trade union confederation for those with university, professional or other high-level education).

Challenges and opportunities

The challenges of access to digital education in each region are distinct:

South Asia

Commitment from Governments in South Asia to making education a priority, with sustainable strategies for implementation at institutional level and strategic programmes and initiatives to drive change;

- Infrastructure: there needs to be a stable supply of electricity and affordable and reliable Internet access at prices that are affordable for most people;
- Human resources: faculty need to be trained to ensure that they can make use of digital technologies;
- A legal and regulatory framework that encourages and supports access to online learning;
- Robust quality assurance, security arrangements to prevent cheating and parity of recognition for online and traditional education;
- Measures to make access equitable.

Europe

- The Higher Education sector is at an inflexion point. Some universities see themselves as global leaders and have chosen to focus on developing new forms of access to education, including the idea that they can develop global student bodies, wherever the students are. Others may well focus instead on access by local communities. The choices institutions make will influence their approach to access;
- The need for lifelong learning and continual upskilling in the knowledge economy, supported by digitalised CPD, will profoundly challenge traditional ideas of who can access Higher Education;
- Relevance is essential for Higher Education. The sector wants both to use digitalisation to widen access and to deepen the connection between the individual learner and the institution.

The main opportunities of extending access are in some ways similar:

- More inclusive education, that is better quality, for more people, for longer;
- Universities enhance their role as drivers of future economies;
- More informed, critical and capable societies;
- More equality of opportunity that in the long run makes for more stable societies where everyone can participate on equal terms.

CHAPTER FOUR:**THE PEDAGOGICAL
CHALLENGE**

“If you remove technology from education, I think there’s going to be very little progress. There are methods that have been applied over and over again whether you look at global case studies or local, I think the ones that have been more successful are the ones who adapted technology at the right time. I think we may have been late in some of those things, but the fact that we are catching on is promising.”

Aqsa Tariq
Risala Publications, Pakistan

“Education is change, and change is at once our greatest strength and our greatest challenge.”

Stephen Downes
Publisher and Editor of OLDaily



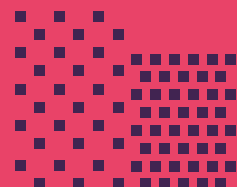
Introduction

The question of pedagogy, the methods and practices of teaching, has been very well researched within and outside academia for many years. Our research indicated that for policy-makers, academic leaders and faculty, pedagogy, along with new modes of knowledge sharing, was the area where digitalisation was making most impact on Higher Education.

Several of our interviewees made the point that we are still, for the most part, firmly entrenched in the pre-digital age. This is true in Higher Education system, even though researchers and technology developers continually proclaim this or that paradigm shift. It is unlikely that this will change in the next five years, though there will continue to be claims and proclamations that we are gradually moving toward the edge. Higher Education is still mostly lecture based (whether virtual or off-line), we still study subjects in cohorts or classes, we still employ texts and workbooks, and we still submit assignments and write tests.

People may change jobs and careers more frequently, learning may be redefined as lifelong, but people change their habits slowly, and institutions even more so, so 'normal education' will still be the norm in five years. But it will be less of a norm than it is today. When we look at the core elements of 'normal' education we see the beginnings of change pushing us gradually to a point where traditional education is no longer viable.

The static structures that used to define education have shifted; we are increasingly in an era of changing boundaries between formal, non-formal, informal and post-formal education. Despite the conservative nature of the educational system (including faculty and students) we have conclusively and irreversibly entered the digital society, and students have permanently changed, as has society.



The pedagogical challenges for universities can be summarised as:

- Student expectations and requirements are changing;
- Flexibility is shaping new ways of delivering programmes and courses;
- Competency-based and outcome-based learning are growing quickly – expanding into fields which long resisted this move, especially for universities;
- How to harness technology to enable new approaches to teaching, learning, assessment and administration;
- MOOCs are offering expanded routes to the delivery and recognition of learning;
- Assessment for learning and the assessment of learning are changing;
- Governments are rethinking quality and accountability;
- Equity remains a challenge, despite massification;
- e-portfolios are emerging as critical resources for students, and
- The roles of faculty are changing.

Our research confirmed that there was a broad consensus that this was an accurate and realistic description of the context within which digitalisation was impacting on Higher Education today, across the world. There was also broad consensus as to what the pedagogical opportunities offered by digital technology were, what worked, and what was required to achieve them. This consensus was summarised in the EU funded 2018 report by the European Association of Distance Teaching Universities (EADTU) on The Changing Pedagogical Landscape as a need for :

- Effective university strategies for digital education;
- Effective implementation of new modes of teaching;
- Investment in teaching staff;
- A vision of continuous education;
- The effective development of Open Educational Resources (OERs) and MOOCs;
- New modes of internationalisation, and
- A supportive policy framework.

Digital education was needed to keep pace with learners in three key areas:

- Degree education: blended degree education will raise the quality, accessibility and efficiency of degree education, where there are increasing numbers of students and lower staff-student ratios;
- Continuous education and continuous professional development (CPD): blended and online education will upscale provision by offering flexible courses with a large outreach responding to the needs of learners at work, who face longer careers and career shifts, and
- Open education: offered online only, open education provides free massive and open access learning opportunities for all, promoting engagement in the knowledge society.

These areas are complementary to each other and to some extent interwoven. Although they are different in terms of target groups and business models, universities create synergies between them. New ICT-based modes of teaching and learning support these provisions.

Pedagogical models for the future

The University of Edinburgh has developed four Future World scenarios for ICT in Higher Education:

1. **Human-led and closed:** Universities expand provision to new parts of the domestic population, develop lifelong programmes and devise new ways to reach international students. Datafication is accelerated and demand for STEM programmes dramatically overtakes humanities and social science.
2. **Human-led and open:** Universities are under pressure to clearly define their distinctive contribution to global challenges and to open up greater choice to students. There will be greater differentiation: providers will be either local, with strong links to local employers, or international brands with strong links to other global brand institutions.
3. **Tech-led and closed:** Automation of many types of manual and professional work prompts greater global demand for Higher Education as a route to advanced skills and knowledge, while a lack of meaningful employment for large portions of the population threatens to dramatically increase wealth inequality. The emphasis of Higher Education shifts toward creative, critical problem solving and social skills as science disciplines increasingly converge with the creative arts and humanities. Augmented, virtual and simulated realities are normalised, while educational neuroscience and the development of new, seamless brain-computer interfaces opens up new possibilities for extreme cognitive enhancement.
4. **Tech-led and open:** The boundaries between employment, education and retirement become looser. Education over a lifetime becomes the norm for the increasingly ageing population. Universities are no longer the main provider of Higher Education, as options to study become available from specialised private and industry sources, open platforms and systems which directly link individual tutors and students in a new economy of provision. Earning a degree becomes less important as badges and micro-credentials become respectable markers of educational value.

These scenarios are speculative, but they have already directly impacted on future pedagogical thinking in the University of Edinburgh. All too frequently, however, ideas of the future are shaped by exciting visions of the possibilities of technology that may or may not be relevant to pedagogy in Higher Education. As **Stephen Downes** notes, technology in education is often far messier than the neat dreams and (commercial) aspirations of Silicon Valley. Another approach therefore is to consider pedagogical innovations that are already in currency but are not yet widespread. The Institute of Educational Technology in The Open University (UK) collaborated with researchers from Norway's Centre for the Science of Learning & Technology (SLATE) to do just that. Their report **Innovating Pedagogy 2019** includes 10 practices, three of which were particularly relevant to this report:

- **Playful learning:** for learners at all stages, to develop creativity, imagination and active exploration, including through digital games. As the OECD notes, there is a growing consensus that formal education should cultivate the creativity and critical thinking skills of students to help them succeed in modern, globalised economies based on knowledge and innovation.
- **Learning with robots:** Skilled teachers engage in frequent conversations with their learners. These interactions take time, but intelligent software assistants and robots can help. These machines set new expectations for what can be achieved.
- **Making thinking visible:** Students create knowledge by interacting with tools and resources. As they do so, they leave traces of their thinking in the form of written marks and interactions with digital media such as videos. Technology-enhanced assessment prompts students to show their working as they solve problems and receive automated feedback. Teachers can see how each student is progressing towards mastery of a topic and can identify where students are blocked or have misunderstood a topic.



Participants in our research recognised that digitalisation was completely changing teaching and learning. Their view was that already we were moving from the campus being the norm and online marginal, to a world of connected campuses where it was possible to study at a prestigious institution from all over the world without having to travel.

All participants faced the need to develop visions that addressed the future based on their best guesses as to which scenario for the future of Higher Education was right for them. They all wanted to make the most of the opportunities offered by technology, locally, by making use of the best thinking available, globally.

Our key findings from each region are described below.

South Asia

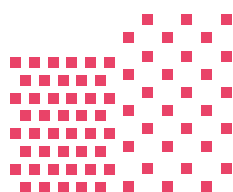
Participants generally agreed that pedagogical priorities in the region identified in this research were the need to address questions of access, upskilling and quality.

Access: depended on the ability to supply relevant learning that met the life circumstances of people who often did not have necessary early educational opportunities, literacy levels, reliable and consistent access to ICT, the financial means either to access traditional Higher Education or the time to commit to formal programmes.

Upskilling: research analysis in the region (as elsewhere) found that learning outcomes for students who engaged in blended learning, or a combination of online and face-to-face instruction, exceeded those of students who received only face to face instruction or purely online instruction. Faculty, however, often lacked the pedagogical and technological skills needed even where the infrastructure was in place. They also often lacked the confidence to start using new pedagogical tools and practices due to their own lack of familiarity with digital methods. Several interviewees also took the view that many students still looked for Higher Education based on traditional approaches. Policy and academic leaders all saw upskilling as a very urgent need if progress in learning was to be achieved.

Quality: there were several initiatives in the region to ensure that quality pedagogical content, needed to address outdated textbooks and teaching materials, could be made available. This was done mainly through collaborations between governments and external partners, often in world-leading institutions. It was considered essential to address quality as existing content was often out of date and learners needed to be reassured as to the quality of online learning. There was concern, and effort, however, to ensure that content met the needs of local learners.

Policy: The success of ICT in Higher Education in the region depended on sound policy planning and implementation on the ground that are closely aligned with the national education goals and complement the national education sector plan. Several interviewees made the point that there were exciting individual initiatives such as the Nepal Open University (NOU) which was opened in 2016, with has the aim of expanding access, but that while these were welcome developments, more needs to be done to integrate technology meaningfully into the education system as a whole



Europe

The overall pedagogical challenge for European universities was very well described in the EADTU report (see above). Our research findings reflected those of EADTU. We also found that although digitalisation in Europe was generally well advanced, there was still a need to do more to fully realise the benefits. In particular, there was a feeling that the pedagogical benefits that had been assumed in the early days of digital education in terms of improved learning outcomes, were real, but that digitalisation's most significant benefits were in terms of students' learning preferences and the potential of learning analytics to help personalise learning for individual learners.

Our research found that cultural factors were acting as impediments to digitalisation. Some students and some faculty were seen as traditional and conservative, valuing traditional pedagogical models more than had been expected. They were not all innovators and they did not all welcome technology, even if they live so-called "digital lives". Findings from all of the countries involved in the report confirmed that.

Nor was it true that in Europe that digital was as large a part of the learning landscape as expected. Most learning still took place using traditional methods. There was scepticism about the claims made for digitalisation by technology companies, consultants, think tanks and others, but that scepticism was not a rejection of the digital, rather it was a sense of realism based on experience.

There was unanimous agreement that digital disruption was impacting and changing Higher Education and academia and the change was set to continue. A new wave of innovative teaching techniques had arrived, and academics were exploring new methods of teaching that were underpinned by digital technologies.

This has led to a great deal of research into pedagogy and attempts to anticipate where the current phase of fast-paced technological change will lead.

Finland: Finland was recognised as world-leading in digital education, especially at school level and for lifelong learning. There was a well-established willingness to experiment with pedagogy in Finland, reflecting the high level of status given to education in Finnish society, high levels of expertise in teaching, devolved decision-making, and openness to innovation and collaboration.

Pedagogy was at the heart of the Government's vision for reform of Higher Education in Finland. The roadmap for the strategy makes the importance of pedagogy clear: "Leveraging digitalisation in Higher Education calls for new pedagogical thinking." While the new strategy was raising expectations of change in universities, they were seen as slow to change, "stiff" institutions with a lot of autonomy.

Finland has a dual system of Higher Education. There are vocational institutions which are not research-based and a relatively small number of "science universities". There was a problem as teacher education can only take place in a science university, but the vocational universities were better at digital and pedagogy.

Teachers in Higher Education had hardly any pedagogical training, so there were a lot of faculty who didn't know about learning and teaching. They still used 200-year-old methods such as lectures, seminars, and book examinations. Higher Education was increasingly net-based but based on knowledge transmission rather than on the creation of engaging learning environments. There was a need to know both the subject and the pedagogical methods. Science universities were very content driven, so teaching was not a priority, but this is changing – it was hard to get a job in a university today if you weren't interested in pedagogy.

Germany: Our research in Germany revealed some differences of view. Our focus group and interviews reflected the view that Germany was still at a point where digitalisation didn't play a big role in Higher Education. Institutions were very traditional and were likely to stay that way for a long time. Teaching and learning worked best through personal contact with teachers and fellow learners. Digitalisation was not a disruptive but an evolutionary thing which did not fundamentally change teaching and learning. There was a sense that wider social and ethical concerns about, for example, data privacy, needed to be taken very seriously before going too far down the road towards personalised learning. Indeed, there was scepticism that personalised learning was a good idea.

Universities were seen as being in their own universe. They were unwilling to use what was already available in terms of content and pedagogy. There were a lot of open resources, but no-one adapted them to their own contexts. It was not typical for German universities to have digitalisation strategies, but rather they relied on motivated Professors.

This did not mean that nothing was happening. Universities had different understandings of what digital means, and that was seen as good. There was no need for every university to set up online learning courses. There were 14-15 modes of approaching digitalisation in universities.

In pedagogical terms, there was a psychology perspective. Digitalisation of knowledge changed how we used our brains. We outsourced large parts of our memory and this required a fundamental change in teaching and learning but it was not happening.

Students didn't know how to properly use technology and levels of demand were not very high. They tended to do what they got credits for – if digital was part of the course then they would do it, but if it was an add-on they struggled.

One reason why Higher Education in Germany was less willing to embrace digitalisation was that there was no sign of any contraction in Higher Education in the European Union so there was no sense of threat to institutions' continued existence. Students did not pay fees before master's level and universities were state funded.

In terms of the future, interviewees thought digitalisation would continue to improve teaching and learning in various ways, but Higher Education will largely remain as brick institutions where people meet, study and discuss. Technology was changing society, especially the advent of AI and algorithms which impact on lives and decisions, but this has just started, and we can't even imagine the future. The role of Higher Education was to prepare students to live in the digital world. Students are future leaders and future writers of algorithms, so universities needed to prepare them even if they didn't know what the future holds.

UK: Digitalisation has been a feature of Higher Education in the UK for many years and the UK has mature online learning institutions including Jisc (originally the Joint Information Services Committee) which is a not for profit membership organisation that champions the importance and potential of digital technologies for UK education and research.

Jisc research into students' attitudes to digitalisation found that most were happy with their institution's digital provision and considered their institution's digital teaching and learning above average. Most students thought that digital provision made them more independent in their learning and agreed that digital approaches helped them fit learning into their lives. Fewer students felt, however, that digital made them feel more connected, and only just over one third wanted more digital provision on their courses, most being content with the current situation.

Our focus group and interviewees agreed that digital clearly offered the only way to reach new groups of students at scale and open up learning to students who wouldn't otherwise be able to access it. They also thought that universities' strategies needed to present a richer picture to potential students that went beyond policy or provider discourses "the language of enhancement and global reach" or academic drives for efficiency. For online education to succeed, it was necessary to show that technology wasn't only instrumental, it had a real social value. Values would be basis for the future of digital education. The question was what digital education would do for the world. Institutions which embraced values would have a competitive edge in the global learning marketplace.

Success Story – UK

Near Future Teaching (University of Edinburgh)

The University of Edinburgh is recognised as a leading centre of research in digital education. The Near Future Teaching project ran between 2017 and 2019 with the goal to develop a values-based vision for the future of digital education at the University of Edinburgh.

The project used futures-thinking and design-based methodologies to work with more than 400 students, staff and others in the co-production of this vision.

Over the two years, it applied the collective agency and creative insights of the university community to the design of a preferred future for teaching and learning.

It advocated for the idea that the University community should take stock and actively shape a preferred future for teaching based on shared values, at a time when technological change was accelerating and often assumed to be driving the future of learning.

Following a programme of workshops and events, short interviews and a review of the key trends, the project developed plausible future world scenarios and mapped a future for university teaching which responded to them. Emerging ideas were then tested out again on staff and students.

The result was:

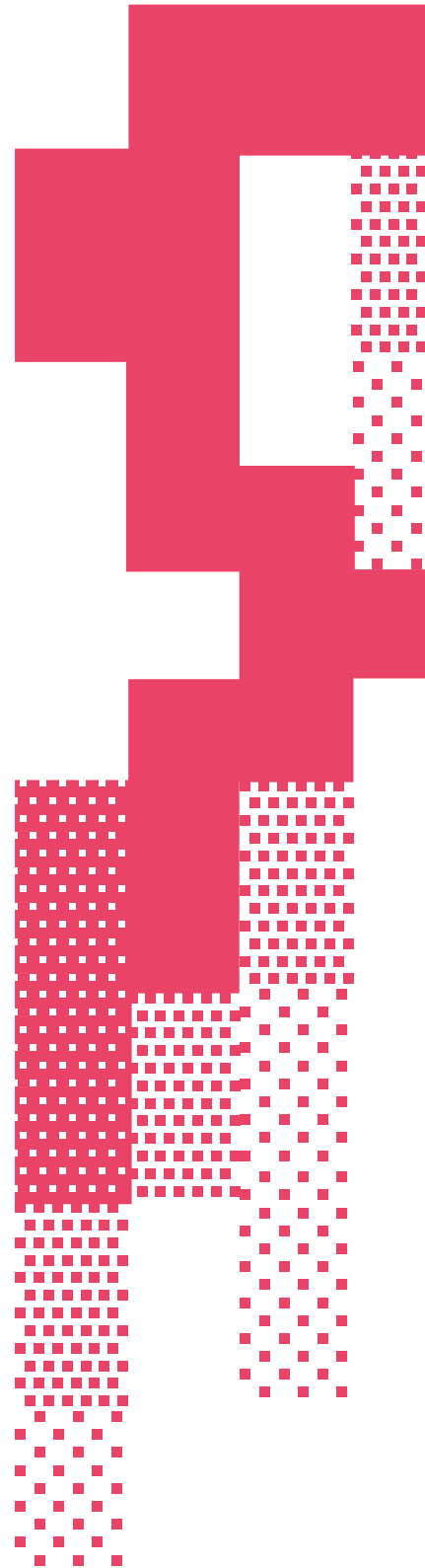
- Four values to guide work on digitalisation:
 - Experience over assessment;
 - Diversity and justice;
 - Relationships first, and
 - Participation and flexibility
- A vision and set of aims and actions for a digital education which is:
 - Community focused
 - Post digital
 - Data fluent
 - Assessment oriented
 - Playful and experimental
 - Boundary challenging

The values echoed some of the thinking in the Innovating Pedagogy 2019 report. For example, Experience over assessment stressed the value of rich experience, creativity, curiosity and even failure. Other aspects of the project such as Participation and flexibility addressed the general challenge of how to provide flexibility for individuals, fluency across disciplines, and cooperative responsibility for curricula.

Challenges and opportunities

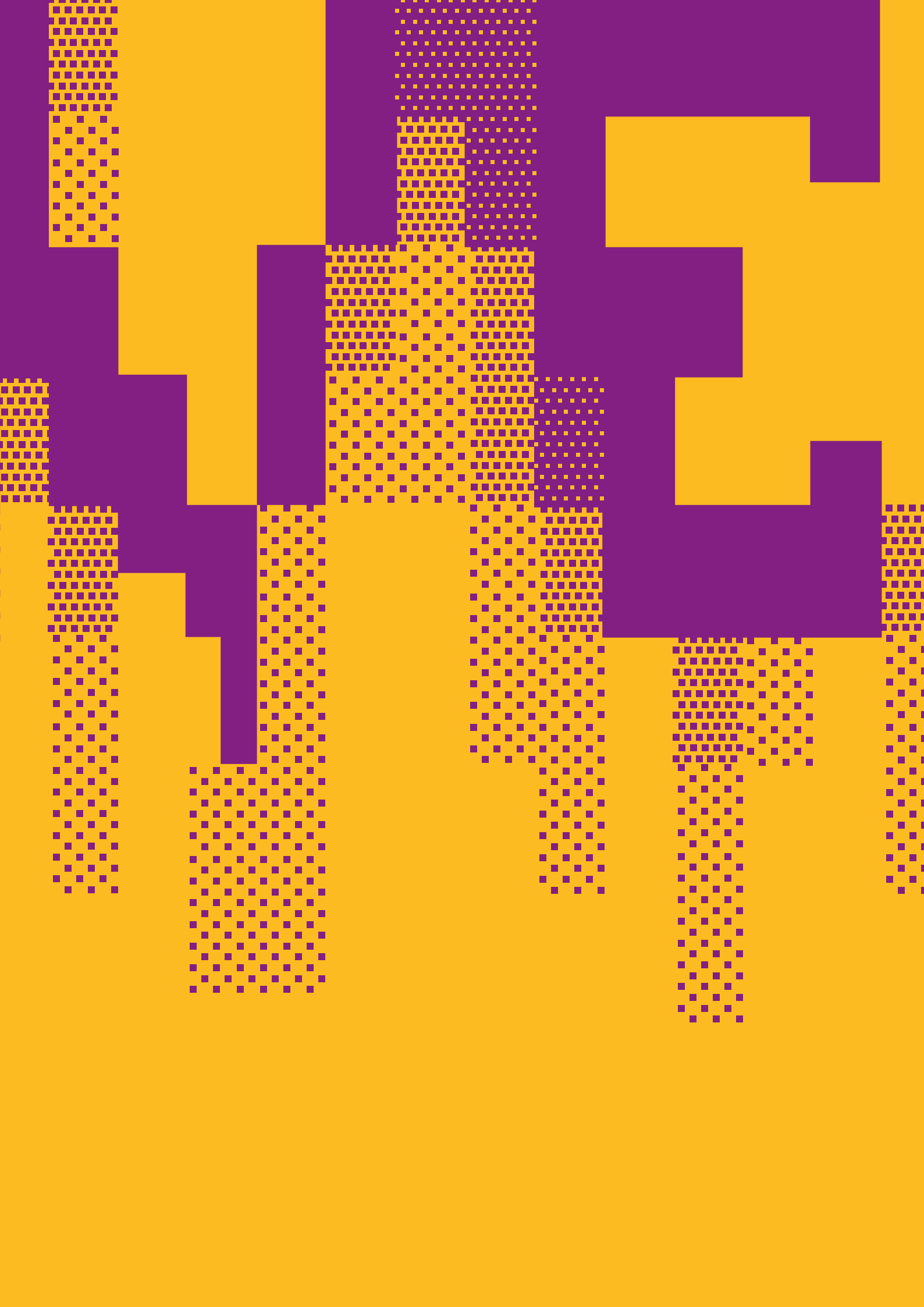
The challenges facing South Asia and Europe have some common dimensions:

- Realising the real potential of digital education to provide quality learning at scale that also meets the needs of very diverse populations of learners;
- How to develop pedagogies that prepare young people for life in the society of the Fourth Industrial Revolution?
- How to leverage digitalisation to develop effective sustainable institutional strategies?
- Lack of pedagogical expertise in Higher Education faculty;
- Making learning lead the technology rather than the opposite;
- How to support ongoing pedagogical innovation?



CHAPTER FIVE:**SOCIAL
PURPOSE**

How can digitalisation in Higher Education help tackle inequalities? What impact can it have on economic development? How can it meet the needs of diverse and often mobile populations?



Introduction

Recent research from Accenture, “Getting to Equal: How Digital Is Helping Close the Gender Gap at Work,” found that increased investment in improving women’s digital fluency in developing countries has the potential to close the gender gap in employment 40 years faster than would be the case otherwise:

It also found that investment in women’s digital fluency pays off - when men and women have the same level of digital fluency (how well they embrace and use digital technologies to become more knowledgeable, connected, and effective) women are better at using those digital skills to gain more education and to find work.

The relationship between digitalisation and equalities is complex and is affected by many factors including culture, tradition and economics, and it is multi-dimensional – it affects whole societies. It was clear from our research that more needed to be done in both South Asia and Europe to ensure that digital education was inclusive.

Equalities: gender

Despite the positive effects of investing in women's digital fluency reported by Accenture, the OECD and the European Commission have both recently reported that the global digital gender divide is growing, despite initiatives to address it.

The OECD report Bridging the Digital gender Divide, (2018) found that: "Hurdles to access, affordability, lack of education as well as inherent biases and socio-cultural norms curtail women and girls' ability to benefit from the opportunities offered by the digital transformation."

The report identified many issues:

- Women still need to be connected: worldwide, women are on average 26% less likely than men to have a smartphone, but in South Asia the difference is 70%;
- There is a gender divide in Internet use, and it is actually widening, especially in the LDCs;
- Men and women differed in their level of the skills needed in the digital era. Women display a relative advantage in ICT task-based skills, but they need better self-organisation, management and communication, and advanced numerical skills;
- The gender gap in entrepreneurship is striking and persistent.;
- Women have less time to spend on upskilling themselves as they are disproportionately involved in unpaid care and domestic work;
- Gender-specific expectations about the future need to change. At 15 years of age, only 0.5% of girls wished to become ICT professionals, compared to 5% of boys;
- Women are less likely than men to participate in massive open online courses (MOOCs);
- Software is a male-dominated world, especially in companies, and
- Women's participation in inventive activities is increasing, but slowly. At the current pace, it will be 2080 before they catch up.

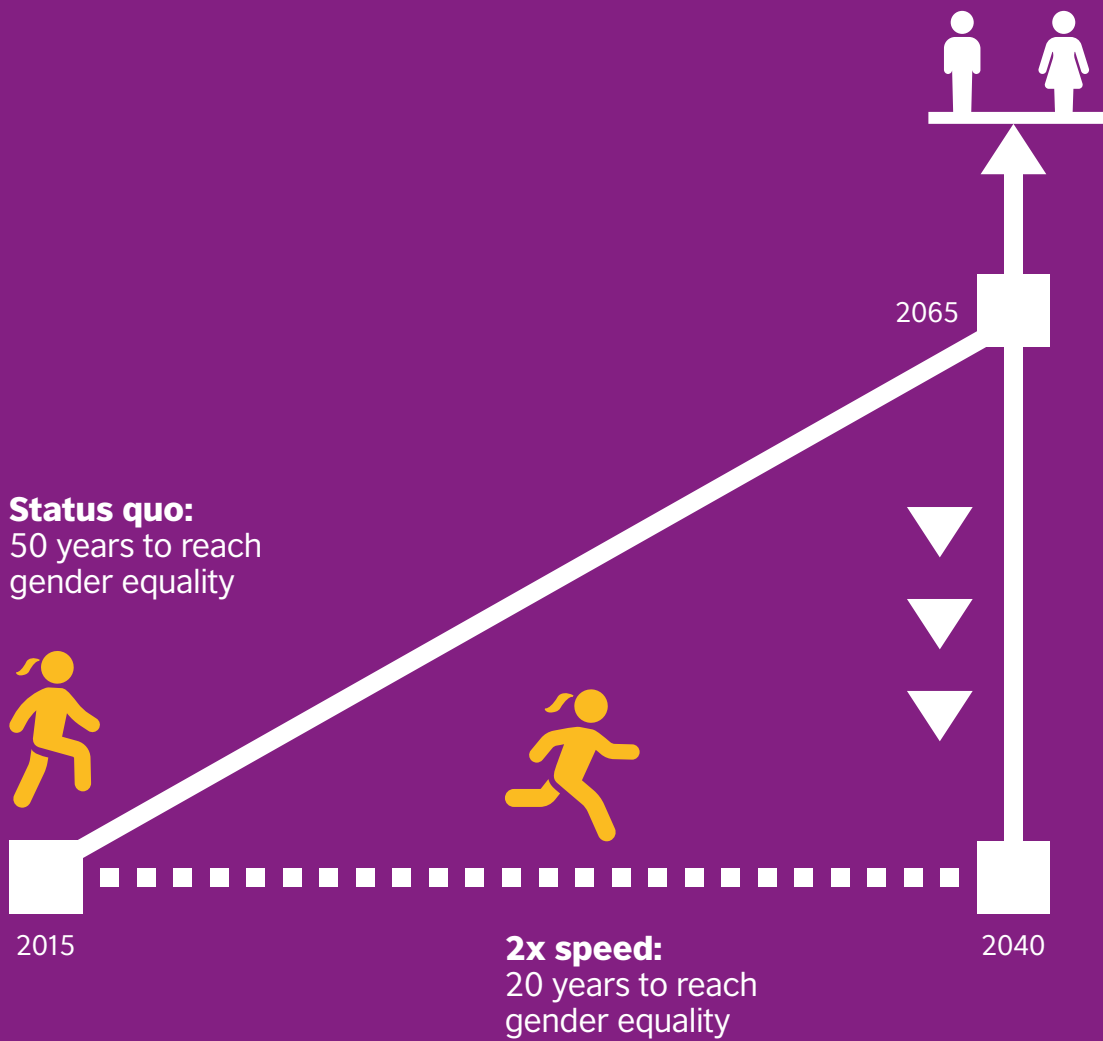
Similarly, the European Commission's Women in the Digital Age study (2016) found that there are fewer women than men taking up ICT-related jobs and education. 57% of tertiary graduates in the EU are women, but only 25% of them graduate in ICT-related fields, and very few enter the sector.

Closing the Gender Gap at Work

Digital fluency is the accelerant

Developed Countries

25 years faster



If governments and business can double the pace at which women become digitally fluent, we could reach gender equality in the workplace by 2040 in developed countries and by 2060 in developing countries.



Equalities: lifelong learning

A theme which came out of all of our research was that of the importance of lifelong learning. Traditional models of Higher Education will not meet the needs of the economy or society. People will increasingly need to upskill throughout life, regardless of the subject of their university education.

However, as with gender, there are challenges. **Recent research** in Europe found that only 31% of people over 65 felt that their university education had prepared them well for the digital world. This suggests that there is an age-related digital divide in the workplace, where older workers are unable to benefit from the opportunities that technology offers. Systematic lifelong programmes of retraining and technological upskilling that target those groups will be needed to bridge those gaps. Moreover, ongoing technological transformations will mean that younger workers who feel prepared today will likely require additional training in the future.

Equalities: a comparative view

The comparison of the experience in South Asia and Europe highlights that the relationship between access to digital education and equalities is a complex, context-specific, and multi-layered issue.



South Asia

In South Asia the main issues relating to equalities are well understood and they predominantly relate to gender, geography, and poverty – all of which are related. Interviewees and focus groups all stressed the enormous opportunities that digital education offers to women, to people in remote areas and to people on low incomes, but they were also clear that there are specific factors in the region which need to be addressed.

Physical access supported by a reliable electricity supply, is still a huge challenge, although major progress is being made. Lack of physical infrastructure is a particular problem in more remote areas.

Lack of physical infrastructure is not only an issue of technology – there is also a lack of educational infrastructure and institutions. In relatively remote areas of Pakistan such as Baluchistan or Khyber Pakhtunkhwa, there were no university campuses and there were cultural barriers to female access to education. It was very hard for female students to go to a major city and enrol in a formal education system.

This lack of physical access is seen as a major opportunity. Whereas it is impossible to reach learners through traditional means, it is seen as possible to enable learners through digital content and thereby make a big difference to educational provision, especially tertiary education, to far flung areas.

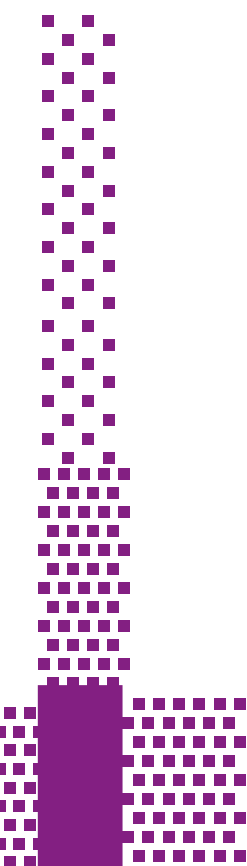
Economics: there are equalities issues in Higher Education because many poorer children drop out of the system before they have completed their school education, making it very hard for them to access Higher Education. There is a gap in literacy and the skills needed to access digital education which is due to lack of basic level provision. Digital technology is more available in the cities, for people who have more money, and that is why – according to our research – it doesn't increase equality, but nor does it reduce it – it merely reinforces existing patterns.

Culture: prevailing norms, behaviours, and attitudes in society at large and in Higher Education institutions affect equalities. Data trends and qualitative analysis suggest that gender inequality in the digital sphere is essentially a result of the persistence of strong unconscious biases about what is appropriate and what capacities each gender has, as well as about the technologies themselves.

Trust: there are questions about whether Higher Education systems can deliver learning online that can be trusted to be equivalent in quality to traditional models. Sometimes this discrepancy is embodied in law.

In addition, in South Asia, there are other factors at play, including being in a conflict or post-conflict situation.

All of these issues were being tackled – not everywhere, all at once, but in different combinations reflecting different circumstances. There are government-level initiatives (covered in the next section), and cultural change and initiatives at micro level are also helping to tackle specific issues such as female digital entrepreneurship. Higher Education clearly has a major role to play in terms of making quality content available as inclusively as possible, in ways that foster inclusion and participation, while addressing perceptions as to what is culturally acceptable and valuable. Online education has to be available. It also has to be seen to be for everyone, of genuine use and relevant to people's needs.



Success Story – Pakistan

Nest I/O

64% of the total population of Pakistan below the age of 30, it is imperative to provide the youth with quality education, gainful employment, and meaningful engagement that can harness their potential and help them compete on the global stage. Contributing to this mission is The Nest I/O, a Karachi-based technology incubator powered by Google for Startups.

Since its inception in 2015, The Nest I/O has graduated 150+ startups over 8 cohorts, including 500 startup founders, 30% of whom are female. 85% of these startups are still functional, while 30% have secured funding to some degree. These startups create jobs, bolster the economy, and bring innovation to verticals ranging from FinTech to EdTech to transportation and social entrepreneurship. Additional programs like Women Scaling Heights, Startup Weekend Women and bootcamps for younger aspiring entrepreneurs add to the depth of the programme.

The Nest I/O provides young entrepreneurs with equity-free support that includes office space and connection to relevant mentors and investors from both home and abroad. Through their best-in-class incubation programme, they augment higher education with startup methodologies and playbooks first developed in global innovation hubs like Silicon Valley and customised for the Pakistani market. To further bridge the knowledge gap between Pakistan and the rest of the world, The Nest I/O also hosts an international conference on entrepreneurship and innovation called 021 Disrupt, where global thought leaders, investors, and entrepreneurs are invited to engage with the Pakistani tech ecosystem.

Through their efforts in digitising the globalisation of startup-related knowledge, The Nest I/O is confident of turning the country's 'youth bulge' into a demographic dividend that will pay off in the long run for Pakistan.

<http://thenestio.com/>

Europe

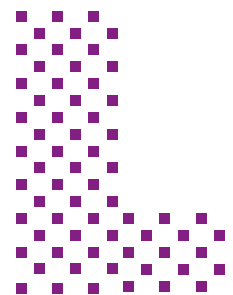
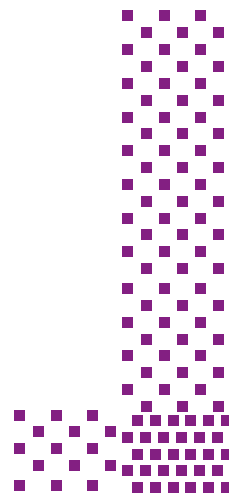
In Europe, the situation is very different but concerns about inequalities are still very present and surprisingly contested. There were different opinions as to the seriousness of the issues, and to their causes. The prevailing view in Higher Education was that digitalisation did not in itself cause any increase in inequalities, indeed it enhanced opportunities for access. This view was surprisingly at odds with our literature review which suggested that there was a digital gender divide in Europe, as in other G20 economies.

These trends are summarised by the OECD as:

“...girls’ relatively lower educational enrolment in those disciplines that would allow them to perform well in a digital world (e.g. science, technology, engineering and mathematics [STEM] and information and communication technologies [ICTs]), coupled with women’s and girls’ limited use of digital tools and relatively scarcer presence or activity on platforms – e.g. for business purposes – suggest a potential scenario of widening gaps and greater inequality, especially in disadvantaged areas.”

The issue for Higher Education in Europe therefore is perhaps more about gender differences in participation rates in certain subjects and the knock-on effects on women's economic prospects than on differential rates of access to education per se. This could account for the views of our participants.

There was more agreement, however, that universities in Europe still have some way to go in preparing graduates for the Fourth Industrial Revolution. Our findings clearly indicated that more needed to be done in relation to producing graduates with the digital skills they need and that this is having differential effects on different groups in the population especially on women and older people. There was unanimous agreement that digital fluency is essential and an acknowledgement that a lifelong learning approach was required.



It is beyond the scope of this study to suggest the reasons, but our literature review did reveal that in Europe at least, the links between digital education, inclusiveness and economic growth are not universally recognised in Government policies. The private sector and international forums such as the WEF seem to be ahead. They make the links in relation not only to Western economies but also to the developing world through mechanisms like SDG 5B which specifically identifies the enhanced “use of enabling technology, in particular ICTs, to promote the empowerment of women”.

There are exceptions of course. Digital inclusion features heavily in the UK’s digital strategy through **a series of initiatives** targeted at women and girls, and also other underrepresented groups, such as people with disabilities and those from minority background or lower socio-economic areas. The strategy stresses that this is not only the right thing to do – it also helps meet skills shortages in the economy. The European Union’s Digital Single Market has a strong focus on gender. However, the digital strategies of Germany and Finland, perhaps surprisingly, do not emphasise equalities and inclusiveness, focusing instead on economic competitiveness.

Challenges and opportunities

The challenge in closing the digital divide is huge, complex and multidimensional. It requires a collaborative, multistakeholder approach to overcome four key barriers to inclusion: infrastructure; affordability; skills, awareness and cultural acceptance; and relevant content.

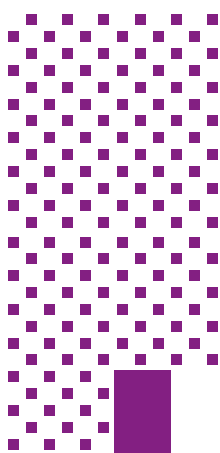
Inclusion matters because companies and governments face a disparity between the skills they need to stay competitive and the talent available to them. The effects vary between countries, however, as does the specific mix between the four main barriers. If to that is added the need to address inclusion in times of conflict or post-conflict, the challenge becomes even greater.

Inclusion is a long-term effort, nor will it be achieved without resistance or with an inevitable expectation of success. As already noted, Accenture estimates that if governments and businesses can double the pace at which women become frequent users of technology, we could reach gender equality in the workplace by 2040 in developed nations and by 2060 in developing nations.

The challenges are known:

- Can digital education in South Asia be made accessible to people who need it, in ways that fit with their lives? Can online education reassure people that it is the same quality as traditional models? How can people be reassured that online education is honest, when cheating is rife? Is the right legal framework in place to support online learning? What are the cultural barriers to online learning?
- Can European Governments ensure that their digital strategies are genuinely inclusive and thereby maximise their economic potential? Can they ensure that digital education is a key mechanism for promoting inclusiveness both at home and globally?

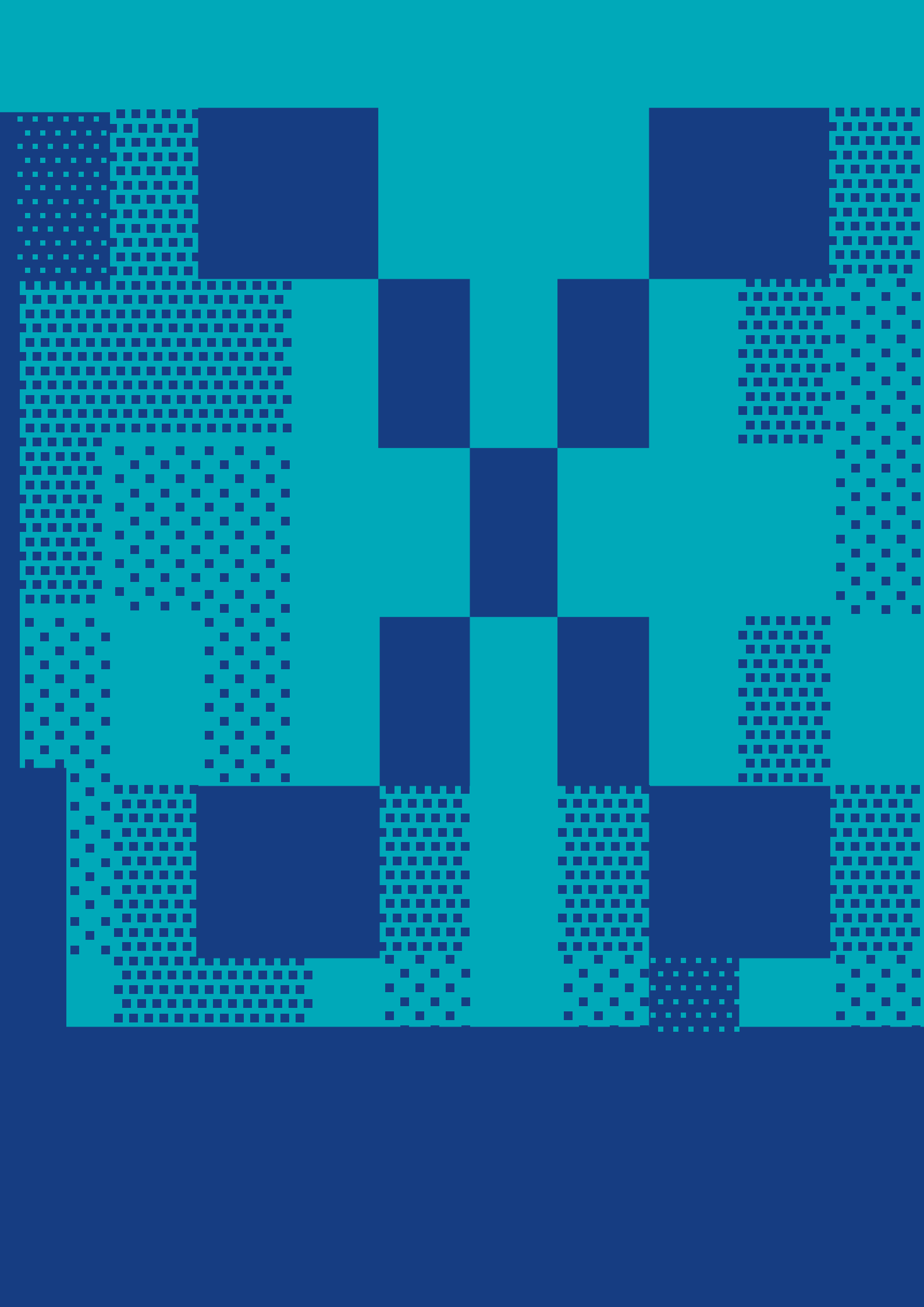
These are important questions for Higher Education and answers need to be found if we are all to flourish in the Fourth Industrial Revolution. Policy-makers want to address economic and social challenges. People see education as a way to improve their life chances, develop the skills they need and take part in global society. Educators see opportunities to supply the education that people want and need. In particular, they see digitalisation as the means by which Higher Education can connect people to knowledge, at scale, in ways that are structured and critical, where learners learn knowledge and skills that are relevant to their interests and goals, and where they learn how to learn and make their way productively in today’s hyper-saturated information society. How can these agendas come together?



CHAPTER SIX:

POLICIES AND INSTITUTIONS FOR THE FUTURE

What is the future of digitalisation in Higher Education in South Asia and Europe? What policy initiatives are needed? What will the university of the future look like? How will the landscape of Higher Education look different?



Introduction As the German Government's Digital Strategy 2025 points out:

“The pace of technological change is picking up, and data traffic is rapidly expanding. One of the main reasons for this is the increasing connectivity of devices, machines and people through the Internet. In 2015 approximately 20 billion devices and machines were linked via the Internet. It is estimated that this number will increase to one-half trillion by 2030.”

Our research found that as digitalisation enables more and more connectivity and collaboration, traditional university functions of research and learning become more and more data driven, and the demands and needs of society for ways to live in the digital world more urgent, there are mounting challenges to the traditional Western model of the university.

There was broad consensus about this, but there were divergences of emphasis between European and South Asian views. In South Asia, there appeared to be a greater readiness to contemplate radical institutional innovation and to contemplate the possibilities that digitalisation offers for new business models. In Europe, the view tended to be that digitalisation was transformative but that its more ardent supporters were over-stating the case that dramatic change was inevitable.

The policy environment was also very different in each region. In Europe there was a sense that some Governments no longer saw digitalisation of Higher Education as a top priority for Ministries of Education. Policy was seen as having an existence independent of educational practice and was therefore not as strong a driver of digitalisation as institutional strategies or innovation from technology companies.

In South Asia, by contrast, Governments saw the digitalisation of Higher Education as a top priority for national transformation. They were encouraging, facilitating and directing major infrastructure investments, making reforms to regulation and looking to world leaders, often (but not always) from the USA, to help to implement policy, whether that was in infrastructure, tackling access issues, training faculty or reforming pedagogy.

South Asia

Participants in the research included Government Ministers, senior policy makers and institutional leaders. Their vision, energy and commitment are reflected in the initiatives described below.

Afghanistan

All issues related to e-learning in Afghanistan are co-ordinated by the Central e-Learning Committee of the Ministry of Higher Education. Afghanistan, as a country, has low levels of access to Higher Education (3.65%, World Bank) and sees digitalisation as a way to rapidly improve access.

As we have seen, access to digital education depends on infrastructure. Progress is being made to connect Afghanistan to the global Internet and bring down the cost of connectivity. There is uncertainty however about the outcome of negotiations with the Taliban, in particular what control the Taliban will have over these big investments. It is hoped that digitalisation will help security as people can generate income online through digitally enabled enterprise and this can be a way to encourage peace.

Nepal

The priority of the Nepalese Government is to “make Nepal” and in doing that, the Government is considering access, capacity and development, in the context of rapidly changing technology. The leader should be able to adjust in a new environment. If the leader can adjust, he can survive, otherwise a new leader will replace him or her. That is why we have to look at the changing conditions of the world. We have to learn from India and China because in digital technology, both the countries are leading the world. So moving forward, this whole area of tertiary education is going to be really taken by digital technology and I see that happening already, even big companies like Google don’t really care where you’re graduating from, they just see how you perform during the test and what your problem-solving skills are and you can get a job there. So, it’s a very interesting area where I’m eagerly looking for this area. And in Nepal if we don’t quickly adapt to this university and higher institution quickly enough, they are going to be obsolete, at least in the sense that they are not going to produce the kind of work force that changes the way they look at things.

Pakistan

The Pakistan Government has a Digital Pakistan Policy. Its vision is to enable accelerated digitalisation to drive the knowledge economy and spur socio-economic growth. The policy is ambitious and comprehensive, addressing all of the challenges identified in this report, with an explicit focus on digitalisation in education and an emphasis on inclusion, particularly for young people and women and girls.

Higher Education is identified as a priority for “sectorial digitalisation”. In practice, this means facilitating and assisting the Ministry of Federal Education and Professional Training to carry out an impressive range of programmes and initiatives which include action to:

- Ensure inclusive and equitable quality ICT education and promote lifelong learning process for all;
- Tackle inequalities by helping empower youth, women and girls, as well as bridge the urban and rural divide, reach currently unserved areas and tackle inequality for people with disabilities;
- Bridge the industry-academia gap;
- Upskill individuals who are important to the economy;
- Collaborate with relevant stakeholders, including International Universities, to improve the knowledge economy
- Promote the capability of school-age children to think independently and foster experimentation and problem-solving;
- Enhance network accessibility at educational institutes across Pakistan, and
- Update the curriculum of IT Higher Educational degree programmes in line with international guidelines.

The Higher Education Commission has a mission to facilitate institutions of Higher Education to drive the socio-economic development of Pakistan. Their Vision 2025 has 3 strategic aims: to “enhance equitable access to Higher Education”; technological readiness to introduce launch ICT embedded educational programmes and to create a culture of research and innovation in Higher Education. Pakistan can thus face the Fourth Industrial Revolution by greater access to Higher Education and through enhanced international collaboration.

Sri Lanka

Sri Lanka's vision is to be an international hub of excellence for higher education by 2020. Sri Lanka's education system is widely regarded as among the best in South Asia and a commitment to improving the quality of teaching at all levels and across the country has resulted in impressive outcomes in recent years.

Sri Lanka's higher education system is relatively small in size. There are only 15 Higher Education institutions under the control of the University Grants Commission (UGC), 6 universities run by other Government departments, and a number of smaller institutes mostly for postgraduate studies. Only around 6% of students (around 30,000) that participate in the public school system from grade one until graduation from secondary school, go on to enrol with a university each year. As a result, avenues are limited for the estimated 83% of qualified students who are not admitted to universities each year, and an estimated 12,000 Sri Lankans seek education abroad every year.

Under the Government's Higher Education for the 21st Century (HETC) project, which ran until 2016, the Government worked to "enhance the capacity of the higher education system and to deliver quality higher education services in line with the equitable, social and economic development needs of the country". The HETC initiative, which was funded with \$40m worth of loans from the World Bank, included work to boost the relevance of university education, largely by ramping up ICT-related and vocational instruction. The HETC programme also involved expanding the mandate of the Sri Lanka Institute of Advanced Technological Education (SLIATE), which is the country's primary technical education institution, and bolstering human resources throughout the higher education system.

Today, action has been taken to enhance the demand in the job market value for local graduates by shifting them towards job oriented education and providing them with effective communication skills and literacy in Information Technology. This strategy should ultimately improve the net value of Human Capital in Sri Lanka.

Online access to Higher Education is a priority as a way to reconcile access and cost, and there is a range of active institutions and initiatives. The Open University of Sri Lanka (OUSL), where students pursue their studies through Open and Distance Learning (ODL) methodologies, has the largest student numbers of any Higher Education Institution in Sri Lanka. In 2017, there were 32,000 students at the OUSL, and today there are more than 40,000.

There are other centres of e-learning including the National e-Learning Resource Center (NELRC) established in the Faculty of Computing and Technology at the University of Kelaniya which aims to meet the national demand and requirements of e-Learning. The University of Colombo School of Computing runs the e-Learning Centre (eLC) which has become a National Centre during the last decade by providing services for both local and international organisations.

The Information and Communication Technology Agency (ICTA) of Sri Lanka is the lead ICT institution of the Government. The ICTA has been mandated to take all necessary measures to implement the Government's Policy and Action Plan in relation to ICT. Its mission is to transform Sri Lanka into a creative knowledge-based society through digitally empowered citizens. The goal is to build a smart and inclusive information society.

Education is a key priority area for the ICTA, as it directly contributes towards the development of a knowledge based society and economy. This vision recognises the importance of ICT in education, as it is seen to contribute directly to government policy to digitise the economy. The ICTA has already commenced and plans to commence large national level initiatives which facilitate which focus on providing quality education for sustainable development, and lifelong learning for all through the use of digital technologies.

Europe

Perhaps the most significant difference between Europe and South Asia is that in Europe there is a well-established multilateral body, the European Union (EU), which can, and does, operate at the regional level to support developments in Member States.

The EU has various roles to play in Higher Education. The Bologna process aims to ensure comparability in the standards and quality of higher-education qualifications. Under the umbrella of Bologna, the Bologna Digital initiative aims to achieve the full potential of digital in Higher Education at the systemic level. Importantly, it aims to do this by focusing on the benefits and challenges related to the increasing digitalisation of peoples' lives.

They take this approach rather than one which starts from the technology, in order to integrate new processes and procedures more easily into mainstream discussions on challenges such as how to assure inclusive Higher Education and high-quality learning environments. Secondly, they hope, in this way, to ensure that barriers and obstacles to accessing higher quality learning for all through digital networks are addressed, minimising the risk of creating a new digital divide.

In other words, digital should not be seen as an add-on to traditional Higher Education, but as a powerful way to meet existing challenges. The EU supports and promotes the role of digitalisation in Higher Education as a major driver of the Fourth Industrial Revolution, helping to support innovation, educate the digital citizens of tomorrow and generate positive social impacts. Its Digital Education Action Plan includes an EU-wide online platform which will be created to support Higher Education Institutions (HEIs) in using digital technologies to:

- improve the quality and relevance of learning and teaching;
- facilitate internationalisation;
- support greater cooperation between HEIs across Europe.

The platform will act as a hub for existing European, national and regional platforms dealing with online learning, blended and virtual mobility, online campuses and exchange of best practice.

As noted in the previous section, the European countries included in the study all have national digital strategies that are at various stages of development.

In the UK, policy responsibilities are shared between the UK Government and the devolved administrations, who have their own strategies and policies. Scotland is an acknowledged leader, with ambitions to become Europe's leading data innovation hub, and universities that having been in the first wave of the development of AI and other key technologies, are today at the leading edge of technological development and digital education in Europe. Germany and Finland have digital strategies. It is probably fair to say, however, that none of these national strategies has as much to say about the crucial role of Higher Education as might be expected, and our research indicated that in Europe the issue of digitalisation in Higher Education was simply not as important a priority for policy as it had been in previous years, and that more attention needs to be given to skills and schools.

Various reasons were suggested for the relatively lower importance of government policy. Several people expressed the view that policy cycles were too slow to keep up with the pace of change. Others thought that universities were more than able to lead the digital revolution on their own, so policy could add little, except to encourage them and create supportive frameworks for innovation.



What will the university of the future look like?

There was no consensus as to what the university of the future would look like, and perhaps inevitably this remains an open question. Suggestions ranged from a digitised version of the traditional campus, evolving to keep pace with the 'conservative' habits of students and the attachment of faculty to tried and tested models, to a wholly radical, networked institution, working globally in collaboration with other universities to bring the best minds alive together for the benefit of the common good.

There were some common themes that have been described above, such as universities having a much more important role in lifelong learning, offering education personalised to the individual learner. This view was common in both regions. Nobody who was asked thought that education would become wholly digital for everyone. There may be some people who could benefit from that, but some form of blended learning was what would fit best with both the potentials of digitalisation and with what was known about learning theory and practice.

Challenges and opportunities for the sector

If there was a consensus from our research, it was that the future sector would be diverse. There may well be mergers between institutions to share resources, reduce costs and extend the range of education and research. It was even suggested that the sector as a whole may shrink by some 50% in the next 10 years in terms of the number of institutions, if not of students.

Less dramatically, many participants referred to the benefits of collaboration between institutions where that made sense, for example, basic learning in some subjects, eg Mathematics, could be standardised, avoiding the current situation where each institution developed its own approach. Even where that had been tried, however, difficulties remained.

The challenges for the sector could be summarised as:

- Using digitalisation to improve equitable access to quality education;
- Relevance:
 - How can digitalisation help address global challenges?
 - Can the sector develop digital learning programmes, products and tools that meet learners' real needs in the knowledge economy?
- How to retain trust and confidence [personal data, access, cheating and plagiarism, AI...]
- How to retain academic independence between the competing agendas of governments, technology companies and fast-changing societies;
- How to equip faculty for the digital revolution;
- How to survive and flourish.

The opportunities are there. Digitalisation is the only way to provide education at the scale needed, and with the flexibility to meet individual needs. If universal education is to become a reality, digitalisation is essential. That alone is a massive opportunity to address global challenges, create economies that give people alternatives to conflict, and ensure that people have genuine opportunities to participate in society. Where digitalisation is already well advanced, there are opportunities to develop pedagogies that better meet learners' needs, and to share knowledge better for the common good. If Higher Education can seize these opportunities, then it will benefit us all.



Appendix: Methodology

This report was produced using the following methodology.

Literature Review

A literature review identified the key issues from the brief, namely a description of key trends in the digital globalisation of knowledge and its relation to Higher Education in South Asia, and the EU. The two regions were treated as case studies and the review aimed to identify areas of common challenge and opportunity, and specific contextual factors that are shaping practice and the debate on the digital in Higher Education.

Online survey

A short small-scale online survey of students, academics, and educational leaders was carried out as a supplement to the literature review.

Focus groups

Focus groups were held in Afghanistan, Finland, Germany, Nepal, Pakistan, Sri Lanka and the UK. They provided an opportunity to explore themes identified in the literature review and draw upon participants' attitudes, feelings, beliefs, experiences and reactions in a way which would not be feasible using other methods.

Individual semi-structured interviews

Key stakeholders in each country will be interviewed using a semi-structured interview technique to explore specific topics in-depth, invite speculation and individual responses.

Analysis and report writing

The findings from the literature review, survey, and fieldwork were analysed by the Consultant, who was also the author of this report.



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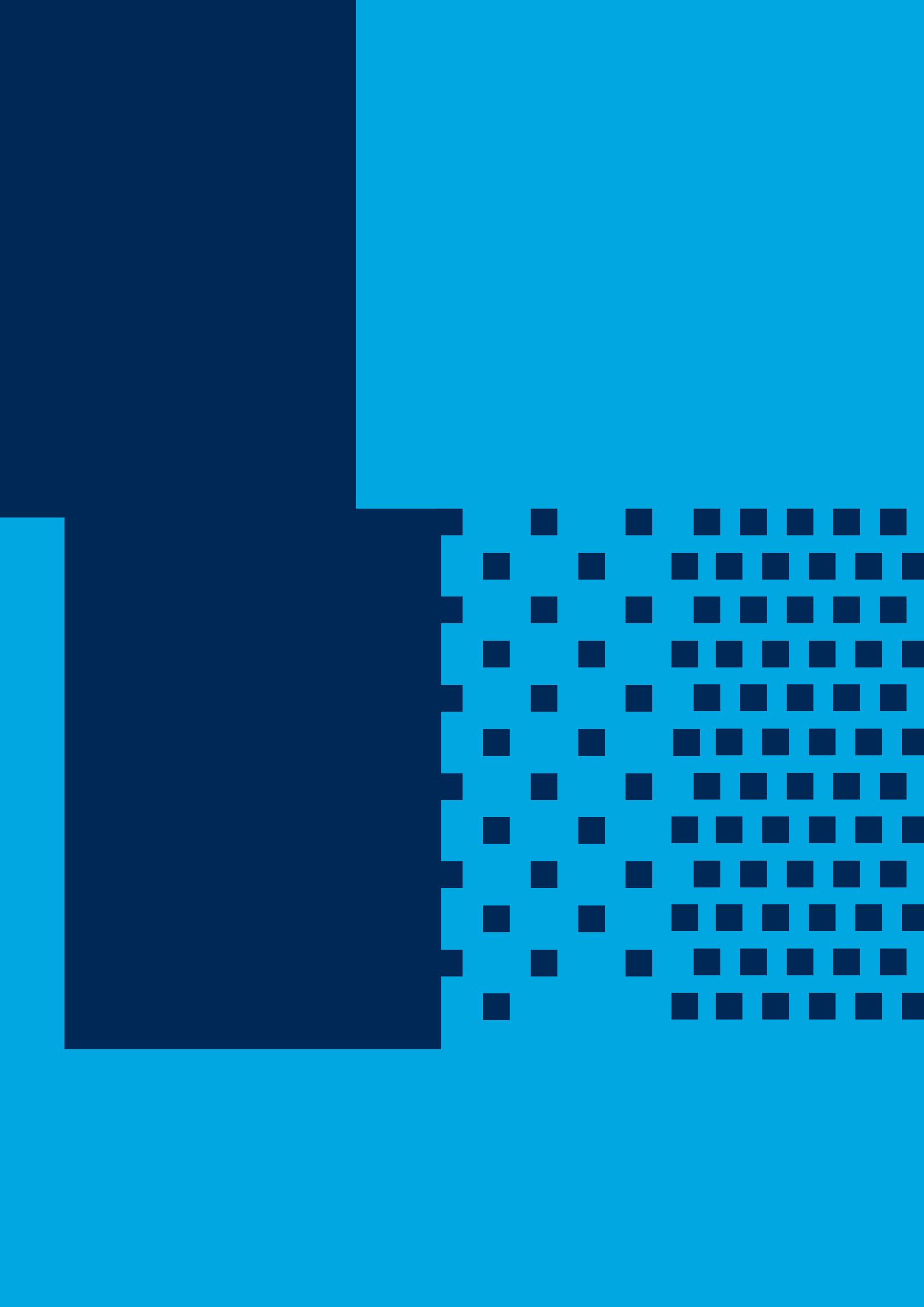
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